Seit > 5 Jahren nicht aktualisiert, Leitlinie wird zur Zeit überarbeitet

Evidenztabellen AWMF 057-008 S3 LL Gestationsdiabetes mellitus (GDM), Diagnostik, Therapie und Nachsorge

3. Epidemiology (incl. definition of risk factors and biomarkers)

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(1) Lu et al. 2016	Meta-analysis observational studies	General	+16500	Vitamin D status at different time points		Association with GDM	Maternal Vitamin D insufficiency is associated with increased GDM risk	Different adjustment models Different measurement time point and methodologiy Pooled data analysis Publication bias?	1-
(2) Schoenaker et al. 2016	Systematic review of observational, cross-section and case-control studies	General	?	Energy supply and dietary factors		Association with GDM	-Replacement of carbohydrates by fat -High cholesterol intake (>300mg/d) -Heme iron intake >1.1 mg/die -High processed meat and egg consumption	Full text not accessible	2+
(3) Berntorp et al. 2015	Observational retrospective	General	Development and validation samples of 5487 each	BMI 75g GTT 2h		Association with LGA	-Relative risk contribution of BMI is stronger than that of aberrant GTT -Weak correlation between BMI and glycemic control	Study groups do not permit prediction analysis	1-
(4) Mohan et al. 2015	Observational prospective	General (India)	201	GCT and GTT at GW >24		Correlation of risk factors with GDM prevalence	-Age > 25 -BMI > 26 -History of GDM	Small sample Heterogeneous medical history	2-

				Risk factor accounting			-Family history of DM -History of macrosomia		
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(5) Wang et al. 2015	Case-control	General (Chinese)	GDM 692 Contr.802	Genetic SNP polymorphism in Vit.D receptor, group-specific component protein (GC), CYP2R1 and CYP24A1		Association with LGA	Association between GC-variants and GDM in obese (BMI >25)	Sub-stratification for BMI narrows validity	2+
(6) Zhang et al. 2015	Meta-analysis observational studies	General	9209	Vitamin D status		Association with GDM	Vitamin D deficiency is associated with higher GDM incidence GDM patients display decreased Vit. D level by 4.93 nM/L	Mostly cross-sectional and case-control studies with high heterogeneity Partial adjustments	1-
(7) Tryggvadottir et al. 2015	Observational prospective	Normal, overweight, obese	168	Dietary regimen from GW 19-24		Incidence of GDM at GW 28 and later	"Prudent" dietary pattern is associ-ated with lower GDM rates	Small samples Post-hoc analysis of preferred diet Incomplete adjustment for confounders	2-
(8) Jaskolka et al. 2015	Meta-analysis observational studies	General	2 402 643	Fetal sex		Prevalence of GDM	Male fetus confers 4% higher GDM risk	Studies limited to GDM diagnosis by 2-step method Pooled estimates No adjustment for covariates	2+

								Publication bias	
(9) Brunner et al. 2015	Meta-analysis observational studies	General	13748	Excessive weight gain (IOM 2009 criteria) before glycemic test		Association with GDM	Excessive weight gain in pregnancy increases GDM risk	Self-reported baseline weight Different assess-ment time points Pooled data No BMI adjust.	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(10) Rowan et al. 2016	Observational case-control	General (multiethnic)	Cases 291 Contr. 661	HbA1c >5.9 at diagnosis	HbA1c <5.9 at diagnosis	Adverse pregnancy outcomes	HbA1c above 5.9 defines a GDM subgroup of higher risk which can benefit from early treatment	Small samples No match for early pregnancy glycaemia No adjustment for BMI and ethnicity	2-
(11) Arora et al. 2015	Cross-section	General (India)	5100	Risk factor recording by questionnaire	75g GTT 2h at GW 24-28 Assessment by WHO criteria 1999 and 2013	GDM risk by 1999 and 2013 WHO criteria	1999: -urban dwelling -illiteracy -non-vegetarian -short stature -high BMI 2013 -urban dwelling -higher age -short stature	Full text not accessible Questionnaire-based data	2+
(12) Honnorat et al. 2016	Cross-section	GDM (IADPSG)	221	Adipokine levels in 3rd trimester		Degree of metabolic risk (HOMA-IR)	High adiponectin levels indicate increased metabolic risk	Full text non-accessible Small sample Several subcategories	2-
(13) Olagbuji et al.	Observational prospective	General, singleton pregnancy (Nigeria)	1059	75g GTT 1-2h at 24-32 GW		GDM prevalence and associated risk factors by 1999 WHO, 2013 WHO, modified IADPSG and IADPSG criteria	WHO 1999: -glycosuria in index pregnancy -history of poor obstetric outcome WHO 2013 / IADPSG: -gycosuria	No data on pre-pregnancy BMI Late diagnosis of GDM No data on GDM history	2-

(14) Schwartz et al. 2015	Meta-analysis observational studies	General (multiethnic)	19053	Ethnicity Parity		Prevalence of recurrent GDM	-Non-Hispanic Whites lower than other ethnicities -Parity increases GDM recurrence -Family DM history irrelevant	Selection bias Differential diagnostic criteria used	1+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(15) Russo et al. 2015	Meta-analysis of RCT and observational studies	General	+3 400	Exercise from ca. GW 16		GDM incidence	Physical activity in pregnancy reduces GDM risk by 28%	Non-adjustment for several confounders (race, intensity)	1+
(16) Huang et al. 2015	Meta-analysis observational studies	General	+2 100	Retinol-binding protein 4		Association with GDM	Significant association of GDM and RBP4 only in Asians and 2nd trimester	Full text non-accessible	2-
(17) Wang et al. 2015	Observational prospective	General (China)	636	Triglyceride/ HDL-Cholest. ratio at the time of GTT		Association with GDM and LGA	TG/HDL-C ratio is independently associated with GDM risk	Monoethnic No data on weight gain dynamics	2+
(18) Rasika et al. 2014	Observational prospective	General (India)	70	Serum uric acid at GW <15 and 24-28	75g GTT 2h at GW 24-28	Association with GDM	Uric acid level at GW<15 strongly correlate with GDM risk at GW 24-28	Small sample No follow-up after GW 28	2-
(19) Han et al. 2015	Case-control and meta-analysis of published data	General (China)	GDM 948 Contr. 975 Meta-analysis +10000	Glucokinase promoter SNP -30G>A		Association with GDM	Case-control: -strong association Meta-analysis: -association in Caucasians and Asians, but not Africans	Presumable publication bias Sub-stratification	2+
(20) Zein et al. 2014	Observational prospective	Non-anemic gravidae	104	Ferritin in 1st trimester	75g GTT 2h at GW 24-28	Association with GDM	Early high ferritin associates with	Small sample	2-

							GTT glycemia, but not GDM		
(21) Egerman et al. 2014	Observational retrospective	Singleton Pre-pregnancy BMI>30	899	17-OH-Prog weekly from GW 16-20 onwards (491)	Daily uterine monitoring (408)	GDM incidence	-13.8% in Prog vs. 9.6% in controls -Prog exposure, age >35 and BMI >40 are associ-ated with GDM	Different GDM diagnostics and time of screening	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(22) Abouzeid et al. 2014	Retrospective population survey 1999-2008	General (Australia)	634 932	Screening at GW 26-28 Diagnosis at GW 26-30		Annual GDM prevalence (crude and age-standardized) Pregnancies in pre-existing DM	-Increase by 64% (overall) and 31% (age-adjusted) over 10 years -Prevalence rise in Australia-born, but not immigrant -Increase in pre-existing DM	Possible incom-plete screening coverage	1-
(23) Wei 2014	Meta-analysis of published data	General	+2 000	Vitamin D status		Association with GDM	Vitamin D deficiency in pregnancy is significantly associated with GDM risk		1+
(24) Ekeroma et al. 2015	Observational retrospective (12 months)	General	6 376	Screening assessment by IADPSG	Screening assessment by NZSSD	Prevalence of GDM	Assessment by IADPSG criteria increases GDM cases by 62%	No adjustment for co-variables	2+
(25) Morikawa et al. 2015	Observational retrospective	General (Japan)	National registry (144000) Single center (430)	Singleton pregnancy	Twin pregnancy	Hyperglycemia risk GDM prevalence	-No difference between singleton and twin pregnancy	Monoethnic population	2+

(26) Kinnunen et al. 2016	Post-hoc analysis of RCT	General (Finland)	+2 700	Iron supple-mentation 100 mg/d, if diagnosed with anemia	Iron supple-mentation 100 mg/d from GW 14	Composite outcome of glucose intolerance	-No differences between groups	Old data (1986) Incomplete GTT coverage No adjustment for dietary Fe	2-
(27) Helseth et al. 2014	Observational retrospective	General	687	GTT at GW 18-22 and 32-36 IADPSG criteria	WHO criteria	GDM prevalence Associated risk factors	7.4% IADPSG 6.1% WHO IADPSG: -age -fasting insulin -no exercise WHO: -age -short stature	Full text non-accessible	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(28) Zhou et al. 2014	Observational prospective	General (China)	1 953	Vitamin D status at GW 16-20	75g GTT at GW 24-28	Association with GDM	-High Vitamin D levels are associated with increased GDM incidence	-No adjustment for nutritional regimen	2+
(29) Bao et al. 2014	Prospective cohort study	Singleton pregnancy	21 411	Pre-pregnancy low-carb diet of animal origin	Pre-pregnancy low-carb diet of vegetable origin	Association with GDM	Low-carb diet of animal, but not plant sources, is associated with increased GDM	Cumulative dietary assessment Predominantly Caucasians aged over 25	2++
(30) Hedderson et al. 2014	Nested case-control	General	GDM 256 Cont. 497	Pre-pregnancy SHBG		Association with GDM	Low pre-preg-nancy SHP (6 years earlier) bear higher GDM risk	Single SHBG measurement No timing of menstrual cycle No data on life style	2+
(31) Burris & Camargo 2014	Expert opinion			Vitamin D status		Association with GDM	Controversial results Importance of adjustment for ethnicity and adiposity		4

(32) Luque-Fernandez et al. 2013	Meta-analysis of published studies	General	9 795	Sleep-disordered breathing		Association with GDM	Significant association, even after adjustment for obesity	Only observational studies Possible publication bias	1+
(33) Reutrakul et al. 2013	Case-control	Non-gravid Gravidae ± GDM	3 x 15	Polysomnography in late 2nd/early 3rd trimester		Association of sleep apnea with GDM	Strong association: nearly 75% of GDM have sleep apnea	Small sample All patients with BMI >30	2-
(34) Kharabanda et al. 2013	Observational retrospective	General (Gravidae)	+220 000	Influenza vaccination	No vaccination	Adverse pregnancy outcomes	Significantly lower GDM risk	Possible non-adjusted confounders	2++
(35) Pamidi et al. 2014	Meta-analysis of published studies	General	several hundreds	Sleep-disordered breathing		Association with GDM	Sign. association, even after BMI adjustment	Adjustment for confounders Different timing	1+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(36) Farah et al. 2012	Observational prospective	Gravidae GW 10-12	1 935	BMI-based selective screening	GTT in risk patients	GDM risk based on BMI centiles	GDM risk escalates at BMI >33.0	Selective GTT Only Caucasians No adjustment for confounders	2-
(37) Harrison et al. 2012	Observational prospective	High-risk GW 12-15	97	Anthropometrics Physical activity record Psychometric	GTT at GW 26-28	GDM incidence	Women at risk have: -low physical activity -excess gestation weight gain -poor risk perception	Small sample Ethnic diversity non-adjusted	2-
(38) Teede et al. 2011	Observational retrospective	General	4 276 (derivation and validation groups)	Medical history at GW 12-15	GTT at GW 26-28	Correlation of clinical risk factors with GDM diagnosis (prediction tool)	GDM predictors: - history of GDM - age >25 - BMI >30 - ethnicity	Sample recruited at high-level facility	2++
(39) Pedersen et al. 2010	Observational retrospective	General and risk population (Greenland Eskimos)	233	75g GTT 2h		Prevalence of GDM	-4.3% in risk population -no patient with clinical GDM signs	Incomplete data Poor criteria of risk definition Attrition bias	2-

(40) Redden et al. 2010	Case-control	General	GDM 1052 Controls +10000	Pre-pregnancy physical activity		Correlation with GDM incidence	Pre-pregnancy exercise lowers GDM odds, but effect is non-significant	Full text non-accessible No objective measures of activity	2-
(41) Soubasi et al. 2010	Observational retrospective	Mothers of preterm neonates	63	Ferritin at GW 29-30		Association with GDM incidence	Ferritin >60 µg/L is associated with higher GDM rate	Small sample with subgroups Accompanying med. condition	2-
(42) Chan et al. 2009	RCT	General at GW<16 and Hb 8-14 g/L	1 164	Fe supplementation 60mg/d	GTT at GW 28 and 36	Diagnosis of GDM at GW 28	-no significant GDM risk	Detection bias Poor medication compliance	1+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(43) Torloni et al. 2009	Meta-analysis of published studies	General		Pre-pregnancy BMI		GDM prevalence	-pre-pregnancy BMI is directly associated with GDM risk	Different GDM criteria Non-adjusted confounders	2+
(44) Toulis et al. 2009	Meta-analysis of published studies	General (gravidae)	PCOS 721 Cont. 4 572	PCOS		GDM prevalence	-higher GDM risk by PCOS is questionable	Heterogeneous designs and outcomes of analyzed studies	1++
(45) Zhu & Zhang 2016	Meta-analysis of published studies	General				GDM prevalence	Global prevalence data Regional comparisons	Full text non-accessible	1+
(46) Pu et al. 2015	Observational retrospective	General (US)	24 195			GDM ethnic prevalence Risk factors	-Higher rates in Asians -Age is the only race-dependent risk factor	Birth certificates used as source of information Reporting bias	1+
(47) Bouthoorn et al. 2015	Observational retrospective	General	7 511	Educational level (with adjustment for		GDM prevalence	-Low educational level increases 3x GDM risk	Different GDM diagnostics Significance disappears after	2+

				proximal mediators)			-Alcohol use and BMI are proximal mediators	full adjustment for confounders	
(48) Schneider et al. 2012	Meta-analysis of published studies	General	n.a.	Geographic distribution in advanced economies		GDM prevalence	-1.7 to 11.6% -Differential rates in self-reports and diagnostic studies	Heterogeneous GDM diagnostic criteria	1-
(49) Hedderson et al. 2012	Observational retrospective (registry)	General (USA)	123 040	BMI and race	Universal GDM screening	GDM prevalence	-BMI-associated risk varies with ethnicity -Asians have high GDM prevalence at "normal" BMI	BMI estimated around GW 17 Incomplete data on confounders	2+
(50) Cardaropoli et al. 2015	Observational prospective	General	2 820	H. pylori seropositivity		GDM incidence	Sign. higher in seropositives	Incomplete con-founder adjust.	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(51) Bao et al. 2014b	Observational prospective	General	21 000 pregnancies in 15 000 women	Fried food consumption monitoring		GDM association	Sign. positive association of pre-pregnancy fried food intake with GDM risk	Long intervals between data collections (4 y) Population mostly Caucasians	2++
(52) Theriault et al. 2013	Observational prospective	General	7 929	Validation of models of risk prediction	75g GTT	GDM association	Risk factors: -history of GDM -BMI -familial history -age	GTT not made in all participants Caucasian populaion	2+
(53) Helin et al. 2012	Post-hoc analysis of RCT	Gravidae at GDM risk	399	Total daily iron intake at GW 26-28	GTT at GW 26-28	GDM association	High Fe intake may increase GDM risk	Self-reported data Narrow "window of time"	2-
(54) Senti et al. 2012	Meta-analysis of published studies	General ?		Vitamin D status		GDM association	Inverse relation-ship between Vit. D and GDM risk	Full text non-accessible	2-

(55) Schwartz et al. 2015	Meta-analysis of published studies	History of GDM	19 053			Recurrence of GDM	-Pooled recurrence rate 48% -Lower rate in Non-Hispanic Whites -Lower rate in primiparae	Selection bias Different diagnostic criteria	2+
(56) Lacaria et al. 2015	Observational retrospective	General (Italy)	2 552	New Italian selective screening guidelines	Old Italian selective screening guidelines	GDM prevalence	GDM prevalence of 10.9% is 25% higher than that with old criteria	Full text non-accessible	2+
(57) Ignell et al. 2014	Observational retrospective	General (urban Sweden)	156 154	75g GTT at GW 28		GDM prevalence over 10 years	Increase by 35% from 1.9 to 2.6%	Annual rate fluctuations No adjustment for ethnicity	2+
(58) Hui et al. 2012	Observational retrospective	General (2 national registries, Germany)	+650 000			GDM prevalence over 10 years	Increase from 1.9 to 3.7% Continuous rise 2001 to 2010	Different test criteria Reporting bias	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(59) Lynch et al. 2015	Observational retrospective	General (singletons, multiethnic)	663 452	Data source: health insu-rance records	Data source: birth registry	GDM prevalence adjusted for age and ethnicity	Increased general prevalence from 5 to 8.4% Increased adjus-ted prevalence Disagreement of data sources	No access to medical records No differentia-tion between GDM and DM Unknown impact of screening methods	2-
(60) Linnenkamp et al. 2014	Review of published epidemiolo-gical studies	General				Reliability of epidemio-logical methodology (IDF)	Data from low-income countries are based almost entirely on WHO criteria	Lack of uniform diagnostic criteria	1-
(61) Guariguata et al. 2014	Review of published epidemiolo-gical studies	General				Global and regional prevalence of hyper-glycemia in pregnancy by WHO criteria (adjustment for screening method)	-Global 16.9% -Age-adjusted 14% -South-East Asia 25% -N. America and Caribbean 10.4%	Wide use of extrapolations and assumptions	1-
(62) Zhang et al. 2011	Observational retrospective	General (urban China)	105 473	Universal screening 50gGCT±75g GTT2h, WHO criteria	Post-hoc assessment by ADA criteria	GDM prevalence over 10 years	Increase from 2.4 to 6.8% Most affected age group 30-34 y WHO >> ADA	Reporting bias due to missing GTT data No adjustment for BMI and life style	2+
(63) Mwanri et al. 2015	Meta-analysis of published data	General (Sub-Saha-ran Africa)				GDM prevalence	14% among high-risk women	Different scree-ning methods Presumed high undiagnosed DM2 prevalence	1-
(64) Leng et al. 2015	Observational prospective	General (China)	18 589	GCT ± GTT WHO criteria and IADPSG		-GDM prevalence -Retrospective changes over 12 years	-Current 8.1% -3.5-fold increase since 1999	Heterogeneous screening tests	2+
(65) Macaulay et al. 2014	Meta-analysis of published data	General (Africa)				GDM prevalence	-Up to 13.9% -Most frequent use of 75g GTT	Moderate-to-high risk of bias Reliable data for 6 countries only	1-

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(66) Khambalia et al. 2013	Observational retrospective	General (NSW/urban Australia) with 2 consecutive pregnancies	142 843	Review of national medical registries		-GDM incidence in 1st pregnancy -GDM re-occurrence in 2nd pregnancy	-First occurrence 3.7% -Re-occurrence 2.7%	Missing data on pre-pregnancy BMI, weight gain and life style	2++
(67) Kun et al. 2011	Cross-section	General (Hungary)	1 835	Universal test 75g GTT 2h IADPSG and WHO criteria		GDM prevalence	-IADPSG 16.6% Risk increases with age, BMI and parity -WHO 8.7% Risk increases with age	Incomplete medical history Dro-out >10% No adjustment for social status	2+
(68) O'Sullivan et al. 2012	Cross-section	General (Ireland)	n.a.	Universal test 75g GTT 2h IADPSG		GDM prevalence	-12.4%	Full text non-accessible Poor information	2-

4. Prevention

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
1) Jelsma et al. 2016	Explorative observational	Gravidae with pre-pregnancy BMI >25	92	Interview Questionnaire		GDM risk perception Perceived importance of life-style interventions	-Insufficient detailed risk information -Baby health is the major motivator -Low acceptance of physical activity interventions	Very small sample Selection bias (non-responders) Cultural confounders not assessed	3
2) Dolatkhah et al. 2015	RCT	Primiparae diagnosed with GDM 24-28 GW	64	Probiotic food supplement over 8 weeks	Placebo	Glycemic control HOMA-IR	-Sign. ↓ FBG -Sign. ↓ IR index -Lower weight gain in study week 6-8	Small sample No adjustment for physical activity	1+
3) Badon et al. 2016	Observational prospective	Pre- and early pregnancy (GW 17)	3807	Leisure-time physical activity	No physical activity	GDM incidence at GW 24-28	Proportional decrease of GDM risk with increase of phys. activity	Self-reported data Investigation tool not validated for pregnant women Selection bias	2+
4) Crawford et al. 2015	Meta-analysis of RCT	Gravidae	567	Myo-inositol	Placebo	GDM incidence	-Decreased GDM risk (low evidence by GRADE criteria)		1++
5) Valkama et al. 2015	Secondary analysis of RCT	GW <20 with GDM history or BMI>30	242	1 individual and 1 group counseling session	General nutritional counseling	Change in dietary habits (low fat etc.)	-Modest effect of dietary counseling	Selection bias	2+
6) Facchinetti et al. 2015	Consensus statement	Gravidae		Myo-inositol		GDM incidence	-Reduction by 80%	Expert opinion	4
7) Saccone et al. 2015	Meta-analysis of RCT	Gravidae	+16 000	Omega-3-PUFA and fish oil	Placebo	GDM incidence	-No significant preventive effect	Full text non-accessible	1+

8) D'Anna et al. 2015	RCT	GW 12-13	220	Myo-inositol	Placebo	GDM incidence at GW 24-28	-Decreased GDM and HOMA-IR	Performance bias Co-medication	1+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
9) de Wit et al. 2015	Explorative observational	GW 15-18 with pre-pregnancy obesity	98	Depressive mood		Daily physical activity	-Depressive mood is associated with poor physical activity	Small samples No adjustment for cultural differences Questionable investigational tools	3
10) Koivusalo et al. 016	RCT	GW <20 with GDM history or BMI>30	293	Individualized life-style counseling	Standard antenatal care	GDM incidence at GW 24-28	-Modest life-style changes decrease GDM incidence by 39%	Performance bias Detection bias	1-
11) Noventa et al. 2016	Meta-analysis of published studies	Peri-con-ception and pregnancy		Inositol			-Reduced GDM incidence	Descriptive No quality criteria applied	4
12) Ruiz-Gracia et al. 2015	Observational retrospective	Gravidae	1750 (CC criteria) 1526 (IADPSG)	Early pregnancy nutritional habits		GDM incidence at GW 24-28 by CC or IADPSG Modifiable and non-modifiable risk factors	-4 high-risk nutritional pat-terns (identifiable by IADPSG)	Semi-quantitative assessment tools (questionnaire)	2+
13) Meinilä et al. 2015	RCT	GW <20 with GDM history or BMI>30	234	Early pregnancy nutritional records		GDM incidence at GW 24-28	-Women at high GDM risk have excessive satura-ted fatty acid and reduced carbohyd-rate intake	Poor precision of investigative tool Selection bias	2-
14) Simmons 2015	Revue of published trial data		Several thousands	-Dietary -Physical activity -Medication		GDM incidence	-GDM is preventable -Reproducible effects of dietary approaches	No quality criteria applied Descriptive	4
15) Bain et al. 2015	Meta-analysis of RCT		4983	Diet and exercise	No intervention	GDM incidence	-No conclusive evidence of risk reduction		2++

16) Van Kampen et al. 2015	Review of published literature	Gravidae (including overweight)	+4000	Physiotherapy -exercise ± diet -counseling		GDM incidence	-No significant effects -Lower insulin dose required	No quality criteria applied Descriptive	4

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
17) Rogozinska et al. 2015	Meta-analysis of RCT	Gravidae	6444	- exercise ± diet -diet only -food supplements		GDM incidence	-No significant effect of exercise and dietary interventions -Promising results with probiotics and myo-inositol	-Reporting bias -GDM was never primary outcome -Different inclu-sion criteria -Co-treatment	2+
18) Xiao et al. 2015	Observational retrospective	History of GDM	2557			Diet quality assessment by Healthy Eating Index-2010	-Women with GDM history have lower diet quality	-Cross-sectional national survey -Self-reported history of GDM -Data validity for US only	2-
19) Zhang et al. 2014	Observational prospective	Gravidae	14437 (20136 singleton pregnancies)	Healthy life style -weight -healthy diet -exercise -no smoking		GDM incidence	-3 lifestyle factors decreases relative GDM risk to 0.59; -4 factors reduce risk to 0.48 -Risk reduction also applies to high BMI	-Self-reported data -97% Whites	2++
20) McGiveron et al. 2015	Case-control	Gravidae BMI > 35 GW 16-18	178	Counseling on weight control, diet	No intervention	Gestational weight gain Pregnancy complications (including GDM)	-Signif. lower gestational weight gain -No effect of intervention on GDM incidence	Small sample Not randomized, thus, different motivation of participants	2+
21) Barrett et al. 2014	Meta-analysis of RCT (head-to-head comparison)	Gravidae	256	Probiotic supplements	Dietary intervention	GDM incidence	-Lower GDM rate with probiotics starting in early pregnancy	Small sample Single affirmative study	2+
22) Skouteris et al. 2014	Review of published controlled trials	Gravidae	?	Behavioral modification		GDM incidence	Significant effect in 1 out of 3 trials	Full text non-accessible	2(?)

							Sign. weight de-crease in 1 of 6 trials		

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
23) Karamanos et al. 2014	Observational prospective	Gravidae	1003	Adherence to Mediterranean diet	Non-adherence	GDM incidence at GW 24-32	Adherence to Mediterranean diet lowers GDM incidence, as disclosed by AUC of GTT	Pooled analysis of data from countries with different social standards	2+
24) Kolu et al. 2013	Post-hoc analysis of a cluster-RCT	Gravidae with at least 1 GDM risk	399	5 sessions of prevention counseling between GW 8-12 to 37	Standard care	Subjective perception of quality of life Cost/effectiveness of preventive intervention	Intervention-related cost increase by 19% Significant effect only for birth weight	Subjective end-point assessment by VAS Validity confined to risk population	2-
25) Ruchat & Mottola 2013	Meta-analysis of published trials		Thousands	Physical activity-based interventions		GDM incidence	No evidence for suitable structured intervention	No quality criteria applied	1-
26) Lindsay et al. 2013	Review of published studies	Gravidae		Probiotics		Fasting glucose GDM incidence	Probiotics reduce FPG and GDM rates	Full text non-accessible Small number of publications precludes formal meta-analysis	1-
27) Rakhshani et al. 2012	RCT	High-risk pregnancy	68	Yoga	Standard activity	...GDM incidence	Significant decrease (2 vs. 1 case)	Small sample	2-
28) Oostdam et al. 2012	RCT	GDM risk pregnancy GW 15	121	Aerobic and strength exercise 2x/wk	Standard care	Fasting glucose Insulin sensitivity GW 24 and 32	No sign. effect Poor cost-effectiveness of exercise program	Poor compliance Attrition bias Small sample	2-
29) D'Anna et al. 2012	Observational retrospective	Gravidae with PCOS	83	Myo-inositol	Metformin (discontinued during pregnancy)	GDM incidence	Significant effect of myo-inositol	Full text non-accessible Small sample Inappropriate control group	2-
30) Baptiste-Robert et al. 2011	Observational prospective	Gravidae GW<14	152	Pre-pregnancy leisure activity index		GCT 1h at 2nd and 3rd trimester	32% decreased probability of 1h GCT response >140	Several self-reported data Small sample	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
31) Oostdam et al. 2011	Meta-analysis of quasi-RCT		1998	Dietary or Training or Metformin	Standard care	GDM incidence Fasting glucose	-Diet counseling and probiotics reduce GDM rates -No robust conclusions	Full text non-accessible Quality-assessed review	1-
32) Luoto et al. 2011	Cluster-RCT	GDM risk pregnancy	399	Activity counseling from GW 8-12 Diet counseling from GW 16-18	Standard care	GDM incidence at GW 26-28	No significant effect on GDM	Detection bias Cluster rendomization	1+
33) Tobias et al. 2011	Meta-analysis of published data			Physical activity before and during pregnancy		GDM risk	Physical activity before and during early pregnancy reduce GDM risk	Self-reported data (questionnaire use)	1+
34) Callaway et al. 2010	RCT	Obese gravidae GW 12	50	Individualized exercise program	Standard care	HOMA-IR at GW 20, 28 and 36	No significant effect on HOMA-IR	Selection bias Unexpected large placebo effect Small sample	2-
35) Morisset et al. 2010	Meta-analysis of published data	Overweight and obese gravidae		Nutritional weight management		GDM incidence	Pre-pregnancy BMI and gestational weight gain influence GDM rates No firm evidence for efficient nutritional intervention	No quality criteria applied Descriptive	2+
36) Kolu et al. 2012	Post-hoc analysis of cluster-RCT	Gravidae at GDM risk	848	Monitoring of GDM incidence		Costs associated with GDM diagnosis and treatment	GDM incurs higher costs -25% overall -44% in-patient -49% neonatal ICU	No adjustment for co-morbidity Regional health care expenses (Finlans)	2+
37) Asemi et al. 2015	RCT	GDM by GW 24-28	45	2x 50000 IU Vitamin D3	Standard care	Perinatal outcomes	-Sign. reduced polyhydramnion	Small sample	1-

							incidence and neonatal hyper-bilirubinemia	Concomitant treatment with folate and Fe Performance bias	
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
38) Zhou et al. 2012	RCT	General GW<20 (singletons)	2 399	Fish oil 800mg/d	Vegetable oil	GDM incidence Preeclampsia incidence Neonatal outcomes	-No significant treatment effect -Reduced macrosomia		1++
39) Cordero et al. 2015	RCT	General	258	Exercise	Standard care	GDM incidence	-Significant reduction		1+
40) Han et al. 2012	Meta-analysis of RCT	General and GDM risk	1 155	Exercise (different programs)		GDM incidence Insulin sensitivity	-No clear evidence for preventive effect		1++

5.1. Acute Outcomes - maternal

Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
41) Sutton et al. 2014	Secondary analysis of RCT	Mild GDM	679	Dietary modi-fication, insulin on demand	Standard care	Rate of Cesarean delivery following labor induction at different gestational age	Induction of labor before GW40 does not increase the rate of Cesarean delivery	Subgroup analysis Small sample	1-
42) Asemi et al. 2014	RCT	GDM at GW 24-28	52	DASH diet over 4 weeks	Standard care	Rate of Cesarean delivery Need of insulin therapy	Significantly lower Cesarean rate and insulin demand in treated patients	Small sample Short treatment duration No objective compliance measurement	1-
43) Wang et al. 2013	Observational retrospective	Different grades (0-4) of glucose intolerance (Taiwan)	7 513			Preterm labor (GW<37) PIH/preeclampsia Cesarean delivery	Increased risk of preterm labor with increasing degree of intolerance	Small proportion of Grade 3 and 4 No adjustment for pre-partal BMI	2+

44) Zawiejska et al. 2014	Observational retrospective	GDM with abnormal FG (IADPSG)	492			Frequency of pregnancy complications	Higher need of insulin therapy Higher rate of poor long-term metabolic control	Full text non-accessible	2+
45) Martin et al. 2015	Observational prospective	BMI >25.0 with/without GDM	1 030			Adverse pregnancy outcomes	Significant inter-action of BMI and GDM only for GA at delivery		2++
46) Barakat et al. 2013	RCT	General	510	Exercise GW 12-39	Standard care	BW gain Cesarean delivery GA at delivery	Intervention reduces risk of Cesarean delivery in GDM by 34%	No adjustment for dietary habits and routine physical activity	1+
47) Bo et al. 2014	RCT	GDM	200	Exercise ± diet	Behavioral counseling	Glycemic control Triglycerides CRP Pregnancy complications	Positive effect of exercise	Small sample Subgroup analysis	1-

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
48) Deveer et al. 2013	RCT	Abnormal 50g GCT and normal 100g GTT	100	Individualized dietary advice	Standard care	Pregnancy complications	Significant effect only on maternal weight gain	No control of compliance Small sample	1-
49) Moreno-Castilla et al. 2013	RCT	GDM	150	Low-carbo-hydrate diet	Standard care	Need for insulin therapy Pregnancy complications	Significant effect only on maternal weight gain	Open label trial	1-
50) Lapolla et al. 2010	Observational prospective	GDM	3 465	Dietary and drug norma-lization of glycemia	Healthy population	Adverse pregnancy outcomes	Correctly diagno-sed and treated GDM results in outcomes similar to those in the healthy population	Virtual control population Heterogeneous therapy	2+

51) Natasha et al. 2015	Observational prospective	Gravidae (Bangladesh)	748	GDM	No GDM	Prevalence of depression during pregnancy	-25.9% in GDM vs. 10.4% in nor-moglycemia -Higher rates in primiparae -Increasing risk with parity	No adjustment for social status	2+

5.2. Chronic Outcomes - maternal

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
52) Maserejian et al. 2014	Observational prospective	General non-pregnant 30-79 years	2 534	Interviews at baseline and after ca. 5 y		Progression of low uri-nary tract symptoms (LUTS)	GDM increases OR of LUTS pro-gression 2x in younger women	Incomplete data on GDM history Reporting bias Interview design	2-
53) Nicklas et al. 2013	Cross-section	History of GDM at 7th post-partum week	71	Edinburgh Postnatal Depression Scale		Incidence of post-partum depression Pregnancy complications related to depression	-34% of patients -Cesarean deli-very and pregnan-cy weight gain	Small sample No adjustment for social factors	2+
54) Akinci et al. 2010	Cross-section	History of GDM at 40+ months after pregnancy	164	75g GTT Serum lipids		Prevalence of metabolic syndrome	Increased proba-bility of metabo-lic syndrome in GDM patients	Absolutely non-matching controls (hospital staff) Inconsistent dia-gnostic standard	2-

5.3. Acute Outcomes - child

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE

55) Platnik et al. 2015	Post-hoc RCT analysis	GW 24-30 Abnormal 3h GTT	932	Time point of start of GDM treatment (GW 24-30)		Adverse perinatal outcomes (composite score)	Earlier intervention does not influence perinatal outcomes	Selection bias ? Data applicable only to mild form of GDM	1+
56) Landon et al. 2009	Post-hoc RCT analysis	Mild GDM GW 24-30	900	Diet ± insulin (on demand)	Routine care	Adverse neonatal outcomes (composite score)	-No differences in hypoglycemia, bilirubunemia, C-peptide, trauma -Birth weight, LGA,macrosomia and dystocia sign. higher in untreated group	No glycemia assessment in untereated group	1++
57) Luo et al. 2014	Cross-section	General GW <13 (China)	276	Individualized nutritional management	Standard care	Birth weight/ Macrosomia	Sign. higher in non-treated group	Small sample Different level of medical attention	2-
58) Easmin et al. 2015	Cross-section	General (Bangladesh)	120	Early-onset GDM	Late-onset GDM	Adverse neonatal outcomes	Asphyxia, NICU admission, hypoglycemia sign. higher in early-onset GDM	Full text non-accessible Data quality unclear	3
59) Cao et al. 2012	RCT	GDM	275	Intensive educational program	Standard care	Adverse neonatal outcomes	Lower birth weight, rates of premature delivery and NICU admission	Full text non accessible Data quality unclear	2+ (?)
60) Bahado-Singh et al 2012	Post-hoc RCT analysis	Mild GDM	932	Diet ± insulin (on demand)	Routine care	Adverse neonatal outcomes (fetal gender-related)	Male offspring in treatment group has lower birth-weight and fat mass	Possible type I error	1++
61) Louie et al. 2011	RCT	GDM at GW 20-32	92	Low glycemic index diet	Conventional high-fiber diet	Adverse neonatal outcomes	No significant differences	Small sample Late start of intervention	1-

5.4. Chronic Outcomes - Child

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
62) Landon et al. 2015	Follow-up of RCT	Offspring of mild GDM	500	Nutritional counseling ± insulin on demand	Standard care	Obesity/metabolic dys-function at age 5-10 y	-No significant differences in primary outcome. -Lower FG and HOMA-IR in treated female, but not male offspring	Underpowered for main outcome Only FG measu-rement	1+
63) Gillman et al. 2010	Follow-up of RCT	Offspring of mild GDM	199	Nutritional counseling ± insulin on demand	Standard care	BMI at age 4-5	No significant BMI difference (despite lower macrosomia at birth)	No adjustment for maternal social status	1+
64) Uebel et al. 2014	Observational prospective	Offspring of normogly-cemic, obese and obese with GDM	44	None		Body composition, insulin and adipokines at age 4mo to 1y	Pre-gravid obesity with GDM is associated with increased insulin and fat mass vs. obesity alone	No data on GDM treatment Predominant male offspring Very small sample	2-
65) Retnakaran et al. 2013	Observational prospective	Offspring of GDM and normoglyc-cemic	104	None		Cardiovascular risk factors and adiponectin at age of 1 y	No significant difference	Small sample No data on GDM treatment	2-
66) Mustila et al_2013	Case-control	Offspring of GDM-risk mothers	185	Diet and exercise counseling	Standard care	Weight gain and BMI at age 4 mo – 1 y	No significant difference	Not randomized Different times of group recruitment	2+
67) Catalano et al. 2009	Observational prospective	Offspring of GDM and normoglyc-cemic	89	None		BMI and metabolic measures at age 6-11	No significant difference Maternal pre-gravid BMI predicts offspring obesity	Small sample	2+
68) Crume et al. 2011	Observational retrospective	Offspring of GDM and	504	Exposure to GDM in utero		BMI growth trajectory from birth to 13 years	No difference before 26 months	No individual growth curves	2+

		normoglyc-cemic					Higher growth in GDM at 10-13 y		
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
69) Krishnaveni et al. 2015	Case-control	Adolescent offspring of GDM and normoglyc-cemic	213	Trier social stress test	None	Cortisol secretion and cardiosympathetic parameters	No difference in cortisol secretion Enhanced cardiac output and RRsys in GDM offspring	Small sample No data on maternal comor-bidity	2-
70) Borgono et al. 2012	Case-control	Offspring of GDM and normoglyc-cemic	104	Exposure to GDM in utero		HOMA-IR at age of 1 y	No significant difference Birth weight is the only predictor of HOMA-IR	No data on maternal weight gain Small sample	2+
71) Hamilton et al. 2010	Observational prospective	Offspring of mothers with different glycemic control	301			Infant weight gain Adiposity at age of 1 y	Increased infant weight gain is independent of maternal glucose tolerance status, but associated with maternal IR	Heterogeneous maternal glycemic status Subgroup with insulin therapy Incomplete data on maternal glycemic control during pregnancy	2-
72) Clausen et al. 2013	Case-control	17-25 year-old offspring of mothers with diet-treated GDM	271	Cognitive function assessment	Background population	Global cognitive score	-Lower scores in GDM offspring disappear after confounder adjustment -Mild maternal glycemia has no adverse effects	-Probable under-diagnosed GDM in control group -Incomplete test tool wit restric-ted sensitivity	2+
73) Gillman et al. 2010	Observational prospective	4-5-year-old offspring of GDM mothers	199	Obesity assessment		BMI Z score	No significant difference	-Several possible bias -No real control	2+

6.0. Screening: Test validity

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(69)Zera et al. 2015	RCT	history of GDM controls	+800	reminder for DM2 screening	no reminder	rates of voluntary screening use			n.a.
(70)Arora et al. 2015	cross-sectional	24-28 GW	5100	WHO 2013 criteria	WHO 1999 criteria	-FG -2 h after 75g OGTT	-WHO 2013 detect 4-fold higher GDM prevalence -2013 FG criteria confirm GDM in 94% of identified cases; 1999 FG only in 11% -criteria are associated with different independent risk factors	Full text non-accessible	2++
(71)Mirzamora-di et al. 2015	RCT	24-28 GW	180	Treatment assigned by IADPSG criteria	Treatment assigned by ACOG criteria	-neonatal hyperbilirubin-emia -premature labor -dystocia -macrosomia	-ACOG>IADPSG -ACOG>IADPSG -ACOG<IADPSG -ACOG<IADPSG	Heterogeneous medical history between groups	1-
(72)Benhalima et al. 2014	Trial protocol								n.a.
(73)Su et al. 2014	Meta-analysis	Postpartum with GDM history	+1000	HbA1c	75g OGTT	-detection of post-partum DM2 in women with GDM history	HbA1c alone has inferior sensitivity with comparable specificity		n.a.
(74)Helseth et al. 2014	cross-sectional	18-22 GW 32-36 GW	687	IADPSG criteria	WHO criteria	-detection rates of GDM -associated risk factors	-Prevalence by IADPSG criteria slightly higher -different	Full text non-accessible Retrospective risk assessment	2+

6.1. Screening - Risk populations

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(75)Arora et al. 2015	Observational	24-28 GW	5 100	Questionnaire FPG + 75g GTT 2h WHO 2013	WHO 1999	-Prevalence -Risk factors according to WHO 2013 and 1999 criteria	-2013→ 35% -1999→ 9% -2013: urban, low height, age -1999: urban, low education, BMI, low height, non-vegetarian	Full text not accessible	2+
(76)Martin et al. 2015	Prospective observational	10-20 GW, follow-up 26-28 GW	1 030	Obesity (1) BMI 30-34.9 (2) BMI 35-39.9 (3) BMI > 40	Overweight BMI 25-29.9	-GDM incidence revealed by FG and 75g GTT 2h -Maternal & neonatal outcomes	-GDM incidence proportional to BMI -Adverse outcomes mostly BMI-, but not GDM-related	Small numbers for certain outcomes	2+
(77)Zein et al. 2015	Prospective observational	GW 24-28	103	75g GTT/WHO Ferritin at GW<12 and GW 24-28		-GDM incidence dependent on ferritin levels	-High ferritin levels in early pregnancy are associated with higher GDM rates -Age, BMI and CRP do not affect GDM incidence	Iron status depends on dietary Fe intake	2+
(78)Morikawa et al. 2015	Retrospective observational	Registry and Focused cohort	+140 000 430	75g GTT 1st tri. 50g GCT 2nd tri. Twin pregnancy	Singleton	-GDM incidence	Registry: singleton > twin Study cohort: no difference	Selection bias in registry	2++
(79)Helseth et al. 2014	Prospective observational	18-22 GW and 32-36 GW	687	75g GTT IADPSG criteria	WHO criteria	-Risk factor association	IADPSG: age, fasting insulin, no exercise WHO: age, short stature Risk factors differ with criteria used	Full text not accessible	2++

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(80)Helseth et al. 2013	Post-hoc analysis of therapy RCT	PCOS	273	75g GTT at 12, 19 and 32 GW IADPSG criteria	WHO criteria	-GDM prevalence -Risk factor association at 12, 19 and 32 GW	-similar, regardless of criteria used -IADPSG: none at GW 12 and 19; low weight gain at GW 32 -WHO: short stature and high insulin at GW 12 and 19; low weight gain at GW 32	Concomitant Metformin treatment in 50% of patients	2-
(81)Mattarelli et al. 2013	RCT	Elevated FG in early 1st trimest.	75	Myo-inositol	Placebo	Incidence of GDM by 24-28 GW, as disclosed by 75g GTT	Sign. GDM reduction by myo-inositol	Small sample Arbitrary risk definition Full text non-accessible	2-
(82)Perovic et al 2012	Observational prospective	24 GW with established GDM risk	110	Ultrasound markers	100g GTT 3h	Correlation of US and glucose intolerance markers	-Ultrasound GDM screening score fully correlates with GTT -Immature placenta appearance strong independent predictor	Full text non-accessible Unclear definition of risk population	2-
(83)Yilmaz et al.	Observational prospective	General (gravidae)	249	Acanthosis nigricans with/winthout Acrochorda	50g GCT ± 100g GTT	GDM risk association	Sign association of Acanthosis nigricans w. GDM	Small number of Acanthosis cases Arbitrary inclu-sion criteria (>3 skin lesions)	2+
(84) Veltman-Verhulst et al. 2010	Observational prospective	PCOS after pro-fertility treatment; no DM	50	Preconceptional SHBG	100g GTT at 24-26 GW	GDM risk association	Low pre-conception SHBG in PCOS predicts GDM liability	Non-adherence to inclusion criteria in +10% Small sample	2-

(85) Chan et al. 2009	RCT	Pregnancy at GW 16, Hb 8-14	1 164	60 mg Fe/die over 16 weeks	Placebo	GDM incidence at GW 28	No difference		2++
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention/ Variable**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(86) Schäfer-Graf, 2009	Expert opinion			HAPO criteria			Macrosomia risk independent of age, BMI and parity		4
(87) Odsaeter et al. 2015	Post-hoc analysis of therapy RCT	Pre-pregnancy PCOS	228	HbA1c in 1st trimester (GW 12)	75g GTT at GW 19 and 32	Prediction power of HbA1c	HbA1c in the 1st trimester cannot predict GDM in a risk population	Concomitant medication Non-adherence to inclusion criteria Different evaluation criteria	2-
(88) Azar et al. 2015	Prospective observational	American Indians (high-risk ethnicity)	259	FPG, OGTT and HbA1c in 1st and 2nd trimester		-Incidence of dysglycemia in 1st and 2nd trimester -Associated risk factors	-50% of 1st trim.positives develop later GDM -1st trim.: weight, waist, HOMA-IR -2nd trim.: weight, BMI, hypertension, insulin	Attrition bias Selection bias Confounding risk factors	2-
(89) Gabbay-Benziv et al. 2015	Prospective observational	?	?	1st trimester maternal characteristics	-GCT results -GDM incidence	-Association of early maternal factors with -GDM incidence Predictive power of risk score model	-Age, race, 1st trim. BMI and syst. RR can predict GDM with sensitivity of 85% and specificity of 62%. -Prediction of nor-moglycemia by this model has lower performance	Full text non-accessible	?
(90) Perovic et al. 2015	Prospective observational	High-risk (gravidae)	331	Fetal liver length in mid-trimester	100g GTT, ADA criteria	-Correlation between mid-trimester fetal liver length and GTT results	-Sign. positive cor-relation -Cut-off value of liver length 39 mm		2+

							-Sensitivity 72%, specificity 97%		

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(91) Lacroix et al. 2014	Prospective observational	General (gravidae)	655	1st trimester: 25-OH-Vitamin D	75g GTT in 2nd trimester	Association of Vit. D levels and glycemic regulation indices (HOMA-IR, HOMA-B)	Low Vitamin D level in 1st trim. is associated with higher GDM risk		2++
(92) Lim et al. 2014	Cross-section	24-28 GW Chinese, Malayan, Indian	799	Adiposity Blood pressure Ethnicity GDM presence		Association of adiposity with hypertension	Association is stronger in Chinese and patients with GDM	Pre-pregnancy status unknown Unequal ethnic group strength	2-
(93) Pintaudi et al. 2013	Retrospective observational	24-28 GW	1 015	75g GTT 2h	Various risk factors	Independent predictive value of risk factors	-FPG > 5.1 -Pre-gravid BMI > 24.4. -Macrosomia history -Family DM history		2++
(94) Bolognani et al. 2014	Cross-section	20-24 GW	240	Waist circumference	75g GTT 2h at GW 24-28	Prediction power of waist circumference	Circumference at GW 20-24 above 86-88 cm can predict GDM	Full text non-accessible	2-
(95) Spencer & Cowans 2013	Retrospective observational	General (gravidae)	7 429	Aneuploidy markers in 1st trimester	75g GTT 2h at GW 24-28	Association of 21- and 13/18 trisomy markers with GDM	-Decreased PAPP-A and HCGß are GDM-associated -No association with nuchal translu-cency		2++
(96) Emet et al. 2013	Prospective observational	General (gravidae)	801	Plasma lipid profiles in 1st and 3rd trimester	50g GCT ± 100g GTT	Correlation of changes in lipid profiles with GDM	-Positive GCT is associated with ↑ triglyceride and LDL and ↓ total cholesterol changes -No correlation between GDM and lipid profiles	No adjustment for nutritional status Changes expressed in % to baseline	2-
(97) Lacroix et al. 2013	Prospective observational	General (gravidae)	445	Adiponectin in 1st trimester	75g GTT in 2nd trimester	Association of GDM and adiponectin in 1st trimest.	Lower adiponectin levels in 1st trimest. are associated with		2++

							increased GDM risk		

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(98) Kautzky-Willer et al. 2012	Practical guidelines					Risk: history of -GDM -FPG >100 -macrosomia -congenital malformation -stillbirth -habit. miscarriage Risk: present -age > 45 -diabetes -adiposity -vascular disease -metabolic syndrome	Recommendations for risk population: -HbA1c or FPG or OGTT as soon as possible (1st trim.) -universal 75g GTT in 24-28 GW for all except for those already diagnosed with GDM (risk population)		?
(99) Kayemba-Kay's et al. 2013	Prospective observational	General (gravidae)	1 650	FP Insulin and Glucose in 1st trimester	75g GTT at GW 28	-Association of early pregnancy insulin levels with GDM and PIH	Preexisting hyperinsulinism is associated with GDM and PIH liability	Attrition >10%	2+
(100) Kulaksiz-oglu et al. 2013	Retrospective case-control	Normal and GDM pregnancy	120	GDM or normal pregnancy	Aneuploidy markers in 1st trimester	Association between GDM and aneuploidy markers	Lower PAPP-A in GDM No association with HCGß and nuchal translucency	Full text non-accessible Small sample Retrospective examination	2-
(101) O'Shea et al. 2012	Retrospective post-hoc analysis	General (pregnant and non-pregnant)	311 (standar-dization) 5208 (appli-cation)	Reference intervals HbA1c in 1st, 2nd and 3rd trimester	IADPSG criteria	-Standard levels of Hb1Ac in non-GDM pregnancy -Diagnosis of GDM by HbA1c as compared to IADPSG	-non-pregn. 4.8-5.5 -1 trim. 4.3-5.4 -2 trim. 4.4-5.4 -3 trim. 4.7-5.7 -HbA1c in 2nd trim. confirms 46% of GDM diagnosed by IADPSG	Full text non-accessible Retrospective examination	2-

(102) Burris et al. 2012	Cross-section	General (gravidae)	1 314	25-OH-Vit. D at GW 26-28	50g GCT ± 100g GTT at GW 26-28	Association between Vit. D and 50g GCT results	-Inverse correlation -Vit. D cut-off limit 25 nmol/l	Cross-sectional design	2++
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention/ Variable**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(103) Corrado et al. 2012	Retrospective observational	General (gravidae)	738	FPG in 1st trim.	75g GTT 2h IADPSG	Correlation between FPG and GDM incidence	-Positive general correlation -FPG > 5.1 in 1st trim. may not be diagnostic, but predictive of GDM risk	Retrospective assessment	2+
(104) Reyes-Munoz et al. 2012	Retrospective case-control	GW < 13	104	History of PCOS or infertility	No gynecol. history	Incidence of GDM (ADA criteria)	PCOS/infertility confer 2.8x higher GDM risk	Ethnicity Confounding treatment Different care	2-
(105) Teede et al. 2011	Retrospective observational	General (gravidae)	2 880 derivation 1 396 validation	GW 12-15 Clinical risk scoring system	50g GCT + 75g GTT 2h	Scoring system performance	Sensitivity for scores > 4 = 68.0% Specificity for scores > 4 = 70.8%	Selection bias Odds ratios derived from same sample	2+
(106) Kuti et al. 2011	Retrospective observational	High GDM risk	765 total	75g GTT 2h in different (1, 2 or 3) trimesters		-Prevalence rate of GDM diagnosis in each trimester -Association of risk factors with GDM	-1 trim. 11.3% -2 trim. 33.3% -3 trim. 55.7% Sign. association of age >30, family history, own history of GDM GDM onset before GW 24 is not uncommon	Ethnic issues Retrospective assessment Late diagnosis cannot exclude earlier GDM manifestation No adjustment for nutritional habits	2-
(107) Kurtbas et al. 2011	Prospective observational	General (gravidae) with risk check	200	Repeated 2-step testing at GW 24-28 and 30-34		GDM incidence beyond GW 28	Additional 5% diagnosed in late pregnancy Sign. association with age and history of macrosomia	Small sample	2+
(108) Samuel & Simhan 2011	Retrospective observational	GDM risk	305	2-step testing before GW 24		Risk factors associated with high GDM	-History of GDM and	Retrospective assessment	2+

						prevalence before GW 24	-Multifetal gestation represent indications for early screening	Indications not verified by the study team	

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(109) Brisson et al. 2010	Prospective observational	General (gravidae)	144	Waist circumfe-rence, FPG and triglycerides at GW 11-14	75g GTT at GW 24-28	Association of abdominal obesity and high triglyce-rides in early pregnancy with GDM in mid-pregnancy	Waist > 85cm and TG > 1.7 mM predict increased GDM risk	Small sample Arbitrary cut-off waist value	2+
(110) Wolak et al. 2012	Retrospective observational	General (gravidae)	5 507	Serum uric acid before GW 20		Association with GDM and pre-eclampsia	Sign. association of highest uric acid normal range (>5.5. mEq/l) quartile	Full text non-accessible Retrospective assessment	2+
(111) Riskin-Mashiah et al. 2010	Retrospective observational	General (gravidae)	4 876	FPG in 1st trim.	50g GCT + 100g GTT 3h at GW 24-28	Prediction power of early FPG vs. pre-gestational BMI	Early FPG and BMI are equally good independent GDM predictors	Retrospective assessment Nationally specific protocol and cut-off limits	2++
(112) Hedderson et al. 2010	Nested case-control	General (gravidae)	345 GDM 800 controls	Weekly weight gain throughout gestation	100g GTT (NDDG criteria)	Association of gestational weight gain with GDM incidence	High weight gain during 1st trimester is associated with increased GDM risk	Retrospective assessment Missing data in 15% of cases Arbitrary tertile assignment	2+
(113) Wolak et al. 2010	Retrospective observational	General (gravidae)	8 114	Serum K levels during 1st half of pregnancy		Association with GDM	High K levels during the 1st half of pregnancy are linearly associated with GDM risk	Full text non-accessible Retrospective assessment Arbitrary stratification	2-

(114) Thadhani et al. 2010	Nested case-control	General (gravidae)	37 GDM 127 controls	Folistatin-like-3 serum levels in 1st trimester	50g GCT + 100g GTT 3h at GW 24-28	Association with GDM	Folistatin-like-3 low levels and white race predict GDM	Small sample GTT not made in all patients	2-

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(115) Laughon et al. 2009	Retrospective observational	General (gravidae)	1 570	Serum uric acid in 1st trimester	GTT at GW 24-28	Association with GDM	Sign. association of highest uric acid quartile (>3.57 mEq/l) independent of BMI Predictive value is not robust enough to support uric acid use in screening	Retrospective assessment No adjustment for dietary habits, ethnicity and renal parameters	2+
(116) Riskin-Mashiah et al. 2009	Retrospective observational	General (gravidae)	6 129	FPG in 1st trim. (HAPO classifi-cation)	50g GCT + 100g GTT 3h at GW 24-28	Adverse pregnancy outcomes	High, though non-diabetic FPG levels are associated with GDM, LGA and macrosomia	Retrospective assessment Reporting bias in 12% of cases	2+
(117) Bo et al. 2009	Nested case - control	General (gravidae)	500 GDM 500 norm	Fe supplement in mid-gestation		Incidence of GDM Incidence of hypertension	-Higher in Fe users (71 vs. 44%) -Higher in Fe users (26 vs. 10%)	Diverse dose duration of Fe No adjustment for several confounders Evidence “ex iuvantibus”	2-
(118) Hedderson et al. 2014	Nested case - control	General (gravidae)	256 GDM 497 matched controls	Pre-pregnancy serum SHBG		Incidence of GDM in subsequent pregnancy	Low pre-gravid SHBG confers ~4-fold increase of GDM risk Low SHBG potentiates effect of other risk factors	SHBG sample not timed to menstrual cycle Missing data on life style over a long period of monitoring	2+
(119) D’Anna et al. 2013	RCT	Family history of DM 2	220	Myo-inositol 2x2g/die from GW 12 onward		Incidence of GDM	Sign. reduction in myo-inositol treatment group	Performance bias (open label) No adjustment for lifestyle and dietary factors Evidence “ex iuvantibus”	1+

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(120) Gyamfi et al. 2009	Post-hoc analysis of 2 RCT	17-OH-Prog treatment for PTD	1 094	17-OH-Prog i.m. between 20 and 36 (34) GW	Placebo	Incidence of GDM	No association of Progesterone treatment with GDM incidence	Secondary analysis of 2 different trials Timing and criteria for GDM diagnosis unknown Higher presence of African ethnicity	1-
(121) Nilofer et al. 2012	Observational prospective	GDM high risk (India)	150	GCT at GW 18 GCT ± GTT at GW 28		GDM prevalence Associated risk factors	-GCT 7.3% positive -GTT 6.0% positive -Age, obesity, family and past GDM history	Multiples not excluded Small sample Unsubstantia-ted conclusions	2-
(122) Sampson et al. 2014	Observational retrospective	Gravidae with GCT (Canada)	531	Medical record review	Social status of residential area (census data)	Occurrence of aberrant GCT	-Patients living in socially deprived areas have higher GCT value by 0.43mM	-Incomplete confounder adjustment -Retrospective design	2+
(123) Bao et al. 2016a	Observational prospective	Gravidae (singletons) over 10 yr.	21 693	Pre-pregnancy potato consumption		Incidence of GDM	Pre-pregnancy potato consumption is associated with higher GDM rates	Self-reported potato exposure and GDM High random error	2+
(124) Bao et al. 2016b	Observational prospective	Gravidae	15 655	Smoking mother (different inten-sity)	Non-smoking mother	Association with GDM	Sign. risk increase in female offspring depending on maternal smoking intensity (>25/d)	Self-reported data on GDM and maternal smoking	2+
(125) Khambalia et al. 2016	Observational prospective and Meta-	Gravidae (1st trim.)	3 776	Ferritin Soluble ferritin receptor CRP		Association with GDM	Increased OR with higher ferritin and iron levels		1++

	analysis of publications						No effect of iron supplementation during pregnancy		

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(126) Cheng et al. 2015	Cross-section	Gravidae (China)	878	Serum amylase		Association with GDM	Amylase negatively correlates with FPG, HOMA-IR and GDM	Full text non-accessible	2+
(127) Shin et al. 2015	Cross-section	Gravidae	253	24h recall of nutritional pattern (NHANES criteria)		Association with GDM	Nutritional patterns are associated with GDM regardless of the predominant nutrient	Cross-sectional design does not permit causal associations No control for DM2 history	2-
(128) Pan et al. 2015	Retrospective case-control	Gravidae with PCOS history (Taiwan)	6 218	PCOS	Age-matched gravidae w/o PCOS	Association with GDM	History of PCOS is associated with sign. higher GDM incidence	Incomplete demographic data Monoethnic	2++
(129) Ruiz-Gracia et al. 2015	Cross-section	Gravidae	1 750	Early pregnancy lifestyle		Association with GDM diagnosed by IADPSG criteria	High-risk-related nutritional patter identified	Data by questionnaire Design not per-missive of causal analysis	2+
(130) Duman 2015	Cross-section	Gravidae (Turkey)	650	50g GCT ± 100g GTT at GW 24-28		Description of risk factors associated with GDM	Age, family DM history, GDM history	Purely descriptive	2-
(131) Olagbuji et al. 2015	Observational prospective	Gravidae (Nigeria)	1 059	Universal screening IADPSG	Re-analysis by various WHO criteria	GDM-associated risk factors	Glucosuria is predictive of GDM by IADPSG criteria	-Monoethnic -No pre-preg-nancy BMI data	2+
(132) He et al. 2015	Observational prospective	Gravidae (China)	3 063	Dietary patterns (nutritional habits)		Association with GDM	Consumption of sweets and seafood increases GDM risk	Short-term observation No data on food intake quantity	2+
(133) Zhang et al. 2015a	Observational prospective	GW <12 (China)	14 198	Blood group		Association with GDM	AB serotype has lower GDM odds		2++

(134) Seabra et al. 2015	Cross-section retrospective	Gravidae (Brasil)	829	FPG in 1st, 2nd and 3rd trimester		Association with GDM	Higher, albeit below cut-off FPG in 2nd and 3rd trimester	Underpowered Data collection over 10 years	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention/ Variable**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(135) Bao et al. 2015	Meta-analysis of published data	Gravidae		Adiponectin Leptin in 1st and 2nd trimester		Association with GDM	Lower adiponectin and higher leptin levels in future GDM patients	No adjustment for ethnicity Data pooling not possible	2+
(136) Sommer et al. 2015	Observational prospective	GW 14 and 28	543	Leptin Subcut. fat BMI	Caucasian vs. South Asian	Association with GDM	Higher leptin and s.c. fat in early pregnancy is associated with higher GDM in S. Asians	High variability between individual ratings	2+
(137) Momeni Javid et al. 2015	Case-control	GDM and healthy gravidae (Iran)	200	Lifestyle		Association with GDM	Diet, physical activity, stress and social support are related to GDM	Data collection by adapted Likert scales	2-
(138) Zhang et al. 2015b	Observational prospective	Pre-conception	258	Serum perfluoro chemicals (PFC)		Association with later GDM	Non-significantly higher levels in sub-sequent GDM	Inacceptable calculation method	2-
(139) Bouthoorn et al. 2015	Observational retrospective	Gravidae	7 511	Educational level		Association with GDM	Low education correlates with GDM Effect mediators are alcohol and obesity	Probable GDM under-diagnosis Self-reporting	2+
(140) Ashrafi et al. 2014a	Cross-section	Gravidae	702	PCOS or Assisted reproduction	Intact gravidae	GDM risk	ART use in PCOS confers 2x higher GDM risk Screening recommended at ART use	Concomitant treatment Retrospective record review	2-
(141) Vejrazkova et al. 2014	Case-control	Post-partum	880	History of GDM	No history of GDM	SNP in melatonin receptor 1B	Higher frequency in GDM Relation to FPG only in non-GDM		2-
(142) Kramer et al. 2014	Observational retrospective	Gravidae	2 741	Hormonal contraception	No contraceptive use	Association with GDM	Higher risk (1.4) with hormonal Lower risk (0.79) with barrier method	Interference with other risk factors Self-reporting	2+

(143) Zheng et al. 2014	Case-control	Gravidae GW 24-28 (China)	255	Gestational weight gain		Association with GDM	GWG >0.28 kg/wk is a GDM risk	Inadequate weight data collection	2-
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention/ Variable**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(144) Ashrafi et al. 2014b	Cross-section	Gravidae	360	Assisted reproduction	Spontaneous conception	Association with GDM	ART confers 2x higher GDM risk	Confounding treatment in ART patients	2-
(145) Cavicchia et al. 2014	Observational retrospective	Gravidae	142 994	Overweight or obesity Ethnicity	Normal BMI	Association with GDM	Risk increases with overweight/obesity Risk by overweight highest in Hispanic	Probable GDM under-diagnosis Inaccuracy of BMI estimates	2+
(146) Mehrabian et al. 2013	Observational prospective	PCOS	180	Pre-pregnancy SHBG		Association with GDM	Inverse association SHBG cut-off <62.5 nM	Underpowered No real control	2-
(147) Brite et al. 2014	Observational retrospective	Gravidae	228 562	Body height		Association with GDM	Inverse association Strongest effect in Asians	Different GDM diagnostic pro-cedures	2++
(148) Beltcheva et al. 2014	Cross-section	Gravidae ± GDM Non-pregnant	394	Adiponectin promoter SNP		Association with GDM	Sign. association of GDM w. *rs266729*	Random controls No adjustment for confounders	2+
(149) Spencer et al. 2013	Observational retrospective	GTT in GW 22-26	7 429	Aneuploidy in 1st trimester		Association with GDM	GDM is associated with sign. reduction of PAPP-A and HCGß	Lower maternal age of non-GDM controls	2+
(150) Stuebe et al. 2014	Explorative	Gravidae (Caucasian, African)	1 363	Genotyping SNP related to DM2		Association with GDM	Different SNP asso-ciated with GDM in each ethnicity		n.a.
(151) Caglar et al. 2012	Observational prospective	GW 13-16	93	SHBG in early pregnancy		Association with GDM	Inverse association	Small sample Insulin-treated GDM subgroup High cut-off	2-
(152) Tudela et al. 2012	Observational retrospective	Gravidae (first visit)	24 883	T4 and TSH		Association with GDM	Likelihood of GDM increases with TSH (subclinical hypo-thyroidism)	Questionable adjustment for ethnicity	2++

(153) Reyes-Munoz et al. 2012	Case-control	PCOS (Mexico)	104	GCT ± GTT at GW 14-24	Age-, parity-, BMI-matched controls	GDM incidence	PCOS 26.9% Controls 9.6% Diagnosis possible in early pregnancy	Pre-pregnancy metformin therapy	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention/ Variable**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(154) Parlea et al. 2012	Nested case-control	GDM	335	25-OH-Vit. D at GW 15-18	Negative GCT	Association with GDM	Low Vit. D levels in early pregnancy predict GDM, independent of race, age and season	Retrospective design No data on Vit. D supplement	2+
(155) Schneider et al. 2011	Observational retrospective	National birth registry	647 392	GDM diagnosis	Pre-eclampsia diagnosis	-Common risk predictors -Independent risk factors	-Pre-pregnancy BMI -GDM is independent risk for PE	Missing records Causality statement not possible	2+
(156) Baker et al. 2012	Nested case-control	GDM	180	25-OH-Vit. D at GW 11-14	Negative GTT	Association with GDM	No significant difference	Retrospective design Selection bias	2+
(157) Dishi et al. 2011	Observational prospective	Gravidae GW <16	3 490	Menarche age Cycle length		Association with GDM	-Menarche age is not related to GDM -Long cycle increases GDM risk	Questionnaire data collection	2+
(158) Bals-Pratsch et al. 2011	Observational prospective	4 weeks after ART in PCOS	107	75g GTT 2h		Diagnosis of GDM	-40% with GDM -14% with impaired glucose tolerance -GTT early after ART recommended	Continuous metformin therapy Possible pre-existing DM	2+
(159) Wolak et al. 2012	Observational retrospective	Gravidae	5 507	Uric acid at GW <20		Association with GDM	Linear association of uric acid in early pregnancy and GDM risk	Full text non-accessible	2+
(160) Low et al. 2011	Cross-section explorative	GW < 18 (Malaysia)	79	Adiponectin gene SNP 45TG		Association with GDM	Sign. association with GDM	Protein expression not examined	n.a.
(161) Ogonowski et al. 2010	Case-control retrospective	GDM by WHO criteria	2 841	Body height	Negative GCT	Association with GDM	Short stature is associated with GDM, but has low	Several confounders with stronger impact	2+

							predic-tive importance		
(162) Phalopra-karn et al. 2009	Observational retrospective	GW < 14	1 876 + 1 900	GDM diagnosis at GW 24-28 (CC criteria)	Negative GCT	Simplified risk scoring model for selective scree-ning by GCT	Age, BMI, parity, history of diabetes, macrosomia and >2 abortions	Cannot replace GTT	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention/ Variable**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(163) Rauh-Hain et al. 2009	Observational retrospective	Gravidae	20 056	Twin pregnancy	Singleton	Association with GDM	-Sign. higher GDM rates in twins -African ethnicity and age 25-30 most affected	Full text non-accessible	2+
(164) Shirazian et al. 2009	Observational retrospective	Gravidae	924	75g GTT 2h ADA criteria	Negative GTT	GDM-associated risk factors	Age, BMI and family history of diabetes	Small GDM group Non-validated score system	2-
(165) McDonald et al. 2015	Observational retrospective	Gravidae (Australia)	4 610	GDM	No GDM	Ethnicity-dependent GDM odds	Asians > African, Caucasian	Selection bias Poor adjustment for confounders	2+

7. Diagnostics

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
74) Pintaudi et al. 2016	National survey	General	122 centers (testing +30 patients/year	IADPSG-based diagnostic guideline (75g GTT)		Compliance with guideline	-IADPSG criteria accepted and applied -Risk patients pre-ferentially tested at GW 16-18	-Questionnaire data collection -Descriptive statistics	2+
75) Morikawa et al. 2016	Prospective cohort	PG>105 and normal 75g GTT in 1st tr. (Japan)	62	50g GCT in 2nd trimester; if positive, 75g GTT		Rate of GDM diagnosis in 2nd trimester	-No risk of late GDM diagnosis after normal 75g GTT in 1st trim.	-Small sample -BMI<22 in all patients	2-

76) Murphy et al. 2016	Observational retrospective	General (nulliparae)	2 432	75g GTT at GW 24-28		Compliance with NIHCE-prescribed GDM risk criteria	-Only 60% of risk patients are properly screened -Ethnicity is the most frequently ignored risk factor	-Single centers use different GDM thresholds –Reasons for non-compliance not examined	2+
77) Hong et al. 2016	Observational retrospective	GDM high risk	569	Early (<GW 20) screening	Normal (>GW 24) screening	Rate of GDM recognition by early and normal screening Adverse perinatal outcomes	-No significant benefits of early GDM diagnosis	-Limited power -Decision on early screening depends on care provider	2+
78) Wu et al. 2016	Observational retrospective	General (singletons) Taiwan	1 840	IADPSG criteria	CC criteria	GDM diagnostic rate	-Sign higher GDM prevalence with IADPSG -Diagnosis made 3 weeks earlier -Improvement of outcomes	-Retrospective design -Monoethnic population	2++
79) Ryser Rüetschi et al. 2016	Retrospective data analysis	General	2 298	Fasting glycemia	75g GTT 1/2h	Sensitivity of fasting glycemic values as alternative to GTT	-FG between 4.4 and 5.1 has 78.5% sensitivity -Use of FG may avoid GTT in 68% of patients	-Selection bias (low GDM prevalence) -Retrospective design	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
80) Iliodromiti et al. 2016	Metaanalysis of published studies	General	2 865	Adiponectin in pre-/early pregnancy	Standard GDM diagnostic test	Predictive power of early adiponectin measurement	-Low adiponectin predicts GDM with 64.7% sensitivity and 77.8% specificity	-Heterogeneous diagnostic thresholds -Parameter affected by age and ethnicity	1-
81) Boriboonhirunsarn et al. 2016	Observational retrospective	GDM	284	GDM diagnosis before GW 20	GDM diagnosis after GW 20	LGA incidence	-Timing of GDM diagnosis is not associated with LGA incidence	-Differences in medical history -No adjustment for efficacy of concomitant therapy	2-
82) Sagili et al. 2015	Observational prospective	At least 1 GDM risk factor	1 231	IADPSG criteria	WHO criteria	GDM prevalence	-Similar prevalence (12.4 vs. 12.6%)	-Single center -No evaluation of outcomes	2++
83) Daly et al. 2016	Observational prospective (self-control)	GDM risk GW 24-32 75g GTT	155 (paired)	Blood transfer on ice Time to analysis 20 min (ADA standards)	Blood transfer at ambient temperature Time to analysis >>20’	Glycemic values GDM detection rate	-Glycolysis prevention strongly recommended -GDM detection rate 2.7 times higher with ice transfer		2++
84) Meek et al. 2016	Observational retrospective	General	25 543	Random plasma glucose (RPG) at GW 12-16	50g GCC plus 75g GTT at GW 24-28	GDM predictive power of early RPG levels	-At cut-off >7.5 RPG has sensitivity 70% and specificity 90% -RPG cannot replace GTT, but predicts risk better than age and BMI	-Two-step testing no longer recom-mended -Monoethnic population with low GDM prevalence	2++
85) Much et al. 2016	Observational retrospective	GDM	944	GDM by WHO criteria	GDM by ADA criteria	Risk phenotype stratification	-Characterization of GDM subtype “overt diabetes in pregnancy”	-Retrospective use of new criteria -Poor phenotype definition	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
86) Wei et al. 2016	Retrospective record analysis	General	9 803	Number of abnormal GTT values (0, 1, 2, >2)		Identification of severe GDM with high risk of adverse outcomes	-2 or more abnor-mal values, or 1 abnormal plus BMI>24, define severe GDM	Full text non-accessible	n.a.
87) Iimura et al. 2015	Observational retrospective	General	175	Serum lipids	GCT+GTT	Correlation of lipid profiles with GDM diagnosis	No significant correlation of abnormal glycemic control with lipids	Reporting bias Incomplete data sets Manipulated data	2-
88) Donovan et al. 2016	Observational retrospective	General (Canada)	86 842	Two-step test		Compliance with diag-nostic recommendations	GTT is made in 75% of indicated cases within 10-15 days after GCT	Full text non-accessible Non-applicable to other health care systems	2+
89) Mosimann et al. 2015	Observational prospective	General GW 8-14	328	Placental growth factor	HbA1c	Prediction of GDM diagnosis	Unlike HbA1c, PIGF cannot predict GDM	Full text non-accessible Unclear data processing	2-
90) Enquobahrie et al. 2015	Case-control	General GW 16	358	Serum fat acids, organic acids, amino acids	GCT+GTT at GW 24-28 ADA criteria	Correlation with GDM diagnosis	A set of 17 meta-bolites in early pregnancy correlates with GDM diagnosis	Several serious methodological flaws Incongruent demographic features	2-
91) Amylidi et al. 2016	Observational retrospective	GDM high risk	208	HbA1c in 1st trimester	75g GTT at GW 24-28	Predictive power of HbA1c	HbA1c >6.0 in early pregnancy can predict GDM	Selection bias (PCOS included) Small GDM sub-group	2-
92) Theriault et al. 2015	Nested case-control	General	792	HbA1c, CRP, SHBG	GCT+GTT at GW 24-28	Predictive power of HbA1c, CRP and SHBG	Higher HbA1c and CRP, and lower SHBG can serve as predic-tive biomarkers	Non-uniform GDM diagnostics Missing infor-mation on risk factors	2++

93) Kwon et al. 2015	Observational retrospective	General	321	HbA1c	100g GTT	Predictive power of HbA1c	HbA1c predicts GDM with 93% sensitivity and 62% specificity	Selection bias	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
94) Renz et al. 2015	Observational cross-section	General (Brazil)	262	HbA1c in 3rd trimester	GTT in 3rd trimester	Correlation between GTT and HbA1c data	HbA1c >5.8 predicts GDM with 95% sensitivity	No outcome analysis	2+
95) Koivunen et al. 2015	Retrospective registry analysis	General (Finland)	2 samples of +55 000 each	Screening policy before 2010	Screening policy after 2010	GDM prevalence and outcomes	Policy after 2010 increased rate of screening from 27 to 51% and GDM prevalence from 9.1 to 11.3%	Full text non-accessible	2++
96) Zhao et al. 2015	Case-control	General	40	Plasma proteomics array profiling	75g GTT at GW 24-28	Correlation with GDM diagnosis	Several differentially expressed proteins	Small sample Significance of most proteins unknown	n.a.
97) Ng et al. 2015	Retrospective data audit	General (singletons)	3 317	Early screen by IADPSG without GCT	Universal GCC±GTT at GW 26-28	Adherence to, and usefulness of new screening policy	-Poor adherence -No usefulness of random BGL in low-risk patients	Single center Data not generalizable	2+
98) Meek et al. 2015	Observational retrospective	General (singletons)	25 543	IADPSG criteria	NICE criteria	GDM incidence	IADPSG criteria identify additional groups of risk, that are missed by NICE criteria	Retrospective design Non-comparable assessment criteria	2+
99) March et al. 2016	Observational retrospective	GDM (singletons)	235	One-step IADPSG	Two-step method	Risk factor prevalence Outcome differences	No significant differences	Limited power Single center	2+
100) Aktün et al. 2015	Observational retrospective	General	1 360	75g GTT WHO criteria		GDM prevalence Outcomes	28% in women below 35 years	Descriptive	2+
101) Fahami et al. 2015	Observational prospective	General	88	FPG and insulin in 1st trimester	50g GCT at GW 24-28	Predictive accuracy of FPG and insulin	Sensitivity 60-67%, specificity 45-47%	Small sample Single center	2-

							Poor prediction	Internal standard for FPG cut-off	
102) Goldstein et al. 2015	Observational retrospective	GDM	46	Two-step procedure		Satisfaction with diagnostic procedure and information about GDM	Model of care largely meets expectations	Poor methodology Small sample	2-
103) Allard et al. 2015	Observational retrospective	General	7 710	GCT+self-monitoring in 1st trimester	GCT+self-monitoring in in 2nd trim.	Referral rates to GDM care	-5.7% in 1st trim. -8.8% in 2nd trim.	Descriptive Subjective data reporting	2-
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
104) Ramirez et al. 2014	Cross-section	Obese ± GDM	72	Adiponectin Cytokines IGFBP-1		Differences between GDM(+) and GDM(-)	Adiponectin and IGFBP-1 levels are lower in obese GDM patients	Small sample No normal reference values Hispanics only	2-
105) Chong et al. 2014	Observational retrospective	General (multiethnic)	1 136	Universal screening 75g GTT WHO criteria	High-risk screening by NICE criteria	Rate of GDM diagnosis	High-risk scree-ning misses more than 50% of GDM cases, espe-cially in Chinese	Selection bias Self-reported pre-pregnancy BMI	2+
106) Farrar et al. 2014	Observational retrospective	General	35 764	Universal GTT	Risk-factor-based GTT	Rate of GDM diagnosis	Universal scree-ning detects more GDM cases No evidence for outcome benefits	Comparison of timely separated cohorts (before/after)	2+
107) Ethridge et al. 2014	Observational retrospective	General (singletons)	8 390	GTT assessed by IADPSG or CC criteria	Normal GTT assessment	Perinatal outcomes	IADPSG-based diagnosis is asso-ciated with higher fetal overgrowth	Disproportional group size Ca. 50% Blacks Incomplete data	2+
108) Neelakandan et al. 2014	Observational retrospective	General (India)	1 106	50g GCT ± 75g GTT		GDM prevalence	Universal screening recommended	Descriptive Unsubstantiated statements	2-
109) Duran et al. 2014	Observational retrospective	General (Spain)	3 276	CC criteria	IADPSG criteria	GDM prevalence Cost of diagnosis and therapy	-IADPSG detects 3.5 times more GDM	Before/after comparison	2++

							-Cost savings of ca. 14 000 € with IADPSG		
110) Yew et al. 2014	Observational retrospective	General (multiethnic)	855	WHO 2013 criteria	WHO 1999 criteria	GDM prevalence	-Decrease by 7.7% when 2013 criteria are used	Full text non-accessible Retrospective design Re-classification	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
111) Hartling et al. 2014	Metaanalysis of RCT					Pregnancy outcomes at different diagnostic cut-offs	-Higher glucose thresholds are not always associated with higher risk -HAPO-based odds ratio 2.0 recommended as temporary pragmatic approach	No comparisons of mutually exclusive patient populations	1+
112) Ikenoue et al. 2014	Observational retrospective	General (singletons) Japan	995	IADPSG criteria		-GDM prevalence -Insulin therapy need with 1 or more abnormal GTT values	-14.2%; higher than with JSOG criteria (2.3%) -2/3 abnormal values require more frequently insulin therapy	Single center Descriptive Retrospective design Single ethnicity	2-
113) Rowan et al. 2014	Observational retrospective	General (multiethnic)	80	HbA1c>40mmol with normal IADPSG results	GDM by IADPSG criteria	Prevalence of higher HbA1c in IADPSG-negative patients	Elevated HbA1c is seen in 21% and 47-62% of these patients are IADPSG-normal	Retrospective design Condition probably predominant in Pacific islanders	2-
114) Corrado et al. 2014	Observational retrospective	General	1 015	Universal screening after IADPSG	Selective screening after NICE	GDM diagnosis rate	NICE risk-based screening misses 23% of GDM	Full text non-accessible Retrospective design	2+
115) Crete et al. 2013	Retrospective case-control	Abnormal GCT	600	+2 abnormal values in GTT	normal GTT (no GDM)	GDM risk factors	Risk-based scree-ning cannot replace GCT	Self-reported data Subgroups	2-
116) Capula et al. 2013	Observational retrospective	General	2 448	IADPSG criteria	Italian guideline 2011	GDM diagnosis rate	Adherence to Italian guideline will miss 30% of GDM cases	Retrospective design	2++
117) Avalos et al. 2013	Observational retrospective	General	5 500	Irish, NICE or ADA criteria	Universal screening by	GDM diagnosis rate	Criteria other than IADPSG	Retrospective design	2++

					IADPSG criteria		will miss 5-20% of GDM cases		
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
118) Hammoud et al. 2013	Retrospective case-control	GDM	249	GDM diagnosed by screening	GDM diagnosed by symptoms	Time of GDMdiagnosis Macrosomia	-Symptom-based diagnosis is delayed by 4 weeks, with macrosomia already present	Full text non-accessible Small sample Single center	2+
119) Kalter-Leibovici et al. 2012	Observational retrospective	General (Israel)	3 345	Different risk-based screening strategies	Universal screening by IADPSG criteria	GDM diagnosis rate	IADPSG use increases GDM detection by 50%	Use of non-validated models of sub-stratification	2+
120) Goldberg et al. 2012	Cross-section	GTT after positive GCT	927	GTT at different times of the day (before 9 or at 9-11, 11-13 or after 13)		GDM prevalence Insulin sensitivity	-GDM diagnosis rate decreases and insulin sensitivity improves in the afternoon	-Selection bias -No adjustment for postprandial intervals	2+
121) Tan et al. 2012	Observational prospective	General (Malaysia)	2 610	GGT, ALT, AST	GCT+GTT ADA criteria	Correlation with GDM diagnosis	Transaminases do not predict GDM	Transaminases assessed before GDM testing High dropout	2+
122) Dahanayaka et al. 2012	Cross-section	General (Srilanka)	405	IADPSG approach	Risk-based screening WHO criteria	GDM diagnosis rate	IADPSG detection rate 8.9% vs. 7.2%	Single center	2+
123) Alanbay et al. 2012	Case-control	GDM and non-GDM	79	GGT	GTT result	Correlation with GDM diagnosis	GGT denotes independent GDM risk	Full text non-accessible Small sample	2-
124) Somani et al. 2012	Observational prospective	General (India)	723	CC or WHO criteria	O'Sullivan criteria	GDM diagnosis rate	CC = 6.36% WHO = 4.8% O'Sullivan = 3.45	Selection bias (no patients >35)	2+
125) Zollner et al. 2011	Post-hoc analysis	Indicated amniocentesis	90	Insulin and C-peptide in amniotic fluid	GTT at GW 24-28	Correlation with GDM, hyperglycemia or perinatal outcomes	No correlation	Very small GDM proportion	2-

126) Chevalier et al. 2011	Observational retrospective	General	11 545	O'Sullivan test	100g GTT 3 weeks later	GDM diagnosis rate	O'Sullivan has false positive rate of 76.8% Preference for 1-step-screening	Missing data on obstetric outcomes after O'Sullivan test alone	2++
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
127) Agarwal et al. 2011	Observational prospective	General (UAEmirates)	849	Fructosamine fasting level	GTT (ADA, WHO,EASD, ADIPS IADPSG)	Predictive performance of fructosamine	Poor performance Not useful for screeening	No adjustment for GDM-related risk factors No outcome correlation	2+
128) Flack et al. 2010	Retrospective record analysis	General	12 785	IADPSG criteria	ADIPS criteria	Workload increase (additional GDM cases) after re-classification	Expected in-crease of 21.7 to 31.9%, if using IADPSG	High diabetes background prevalence in study population No outcome analysis	2+
129) Riskin-Mashiah et al. 2010	Retrospective record analysis	General (singletons)	4 876	Fasting PG in 1st trimester	GCT±GTT at GW 24-28 (CC criteria)	Predictive power of early fasting PG	High, albeit nor-moglycemic FPG denotes indepen-dent GDM risk	No universal GTT verification (reporting bias)	2+
130) Huidobro et al. 2010	Observational retrospective	General	404	GDM diagnosis in 3rd trimester	GDM diagnosis in 2nd trimester	Risk factors associated with diagnosis timing	Early diagnosis is associated with higher age, FPG and HOMA-IR. Late cases have family history of DM2	Small GDM sample No adjustment for concomitant treatment	2-
131) Agarwal et al. 2009	Observational prospective	General (UAEmirates)	1 465	Fasting capillary glucose	75g GTT (ADA criteria)	Predictive power of fasting capillary glucose	Capillary glucose at threshold 4.7 has 86% sensiti-vity, but 44% false positive rate	No adjustment for GDM-related risk factors No outcome correlation	2+

132) Minsart et al. 2009	Retrospective record analysis	General	1 715	Universal 50g GTT 1h	Selective 2-threshold screening (Naylor score	GDM prevalence	Universal screening detects 50% more GDM cases Selective screening not recommended	Study samples separated by 2 years No adjustment for outcomes	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
133) Cheng et al. 2009	Observational retrospective	General	14 693	CC criteria	NDDG criteria	GDM prevalence OR of perinatal complications	-CC criteria detect GDM in 5.1%; NDDG in 3.3% -GDM by CC criteria has high OR of Cesarean delivery, weight over 4500 and shoulder dystocia	OR comparison with non-GDM patients No information on GDM treatment Retrospective design	2+
134) McCarthy et al. 2010	Observational prospective	General (Argentina)	1 702	Selective screening	Universal screening	Relevance of selection by risk factors	-49.5% of GDM cases have at least 1 risk factor -Poor sensitivity of selective scree-ning -Universal screening recommended		2+
135) Tan et al. 2009	Observational prospective	General multiethnic (Malaysia)	1 368	50g GCT at GW 28	75g GTT (WHO criteria) for confirmation	Perinatal outcomes in GCT positive, false-positive and negative	-GCT cut-off of 7.2 has 90% diag-nostic sensitivity -False-positive GCT is associated with intermediate risk	Selection bias (GCT negative as reference) Missing GTT data Single center	2-
136) Idris et al. 2009	Cross-section	General multiethnic (Malaysia)	366	Universal GCT screening	Selective screening	Sensitivity and specificity	-Sensitivity of both tests is simi-lar (82-83%) -Selective scree-ning has lower specificity (61 vs. 76%)	Single center Relatively small sample	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
137) Cosson et al. 2014	Observational prospective	General multiethnic	17 344	Universal 75g GTT (WHO criteria)		-Association of French risk factors with adverse outcomes -Ethnic distribution of association	-Association confirmed in the presence of at least 1 risk factor -Association not applicable to Asians -Univ. screening recommended regardless of ethnicity	Caucasian ethnic subpopulations excluded Underrepresented subgroups Within-subgroup heterogeneity ignored	2+
138) Yeral et al. 2014	RCT	General (1st trimester)	486	50g GCT (CC criteria) 75g GTT (ADA criteria)	FG	-Sensitivity -Specificity	-ADA > CC > FG -ADA = CC > FG -75g GTT recom-mended for scree-ning in 1st trim.	Full text non-accessible High attrition bias	1-
139) Goldberg et al. 2013	Prospective observational	Negative GCT in 2nd trimester	200	50g GCT	GTT	-Predictors of false-negative GCT result	-higher GCT glucose value -no predictive threshold	Full text non-accessible	2-
140) Tomic et al. 2013	Observational prospective	Women at GDM risk	1 002	75g GTT		-Glycemia threshold for manifestation of adverse outcomes	Appearance of adverse outcomes is associated with higher glycemic values at any test time-point	Full text non-accessible	2-
141) O'Dwyer et al. 2012	Observational prospective	Obese (BMI> 34.9)	100	GTT before GW 20		GDM prevalence	-20.5% display abnormal results -Early screening recommended	Single center Small sample Additional risk in 20% of patients	2-
142) Meltzer et al. 2010	RCT	General	1 594	50g GCT ±100g GTT 3h optional		-GDM prevalence -Cost of diagnosis	-Similar prevalence	Single center	1++

				50g GCT ±75g GTT 2h optional 75g GTT 2h			-Higher efficacy of 2-step method -Higher cost of 75g GTT alone		

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
143) Sevket et al. 2014a	Observational prospective	General GW 24-28	339	HbA1c	GTT (IADPSG)	Sensitivity Specificity	-At cut-off of 5.2 HbA1c sensitivity is 64% and specificity 67.5% -HbA1c alone is non-sufficient for GDM diagnosis	Full text non-accessible	2+
144) Ekeroma et al. 2015	Observational retrospective	General	6 376	Screening assessment by IADPSG	Screening assessment by NZSSD	Prevalence of GDM	Assessment by IADPSG criteria increases GDM detection by 62%	No adjustment for co-variables	2+
145) Helseth et al. 2014	Observational retrospective	General	687	GTT at GW 18-22 and 32-36 IADPSG criteria	WHO criteria	GDM prevalence Associated risk factors	7.4% IADPSG 6.1% WHO IADPSG: -age -fasting insulin -no exercise WHO: -age -short stature	Full text non-accessible	2+
146) Sevket et al. 2014b	RCT	General	786	75g GTT 2h (IADPSG)	50g GCT + 100g GTT (CC criteria)	GDM prevalence	One-step =14.5% Two-step =6%	Full text non-accessible	1-
147) Odsaeter et al. 2015	Observational restrospective	Post-PCOS (singletons)	228	HbA1c in 1st trimester	FPG and GTT in 1st, 2nd and 3rd trimester IADPSG crit.	Correlation between HbA1c and GTT results	HbA1c in 1st trim. cannot predict GDM appearance in PCOS	Concomitant treatment, incl. pre-pregnancy metformin and insulin on demand	2-

148) Agarwal et al. 2015a	Observational retrospective	General	2 337	75g GTT	Cut-off limits of ADA, CDA and IADPSG	Effect of laboratory error on GDM prevalence	ADA = 13.3% CDA = 30% IADPSG=45.3% Error strongly affects diagnosis	Retrospective design Single center No match of NDDG variation	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
149) Coop et al. 2015	Virtual model forecast on historic data	General hypothetic	62 000	2-step screen HbA1c + 75g GTT 2h	3-step screen HbA1c + GCT 1h + 75g GTT 2h	Cost-effectiveness	2-step-strategy slightly increases GDM detection rates Associated addi-tional costs over 9 months are +12000 NZ$/case	Virtual approach Theoretically pre-set sensitivity and specificity Estimated prevalence data	2-
150) Park et al. 2015	Observational retrospective	GDM risk de-noted by 50g GCT	258	FG and 100g GTT 3h (CC criteria)		Association between number of abnormal GTT values (0,1,2,3,4) and birth weight	FG predicts birth weight, especially in patients with 0 or 1 abnormal GTT values	Retrospective Small subgroups Concomitant insulin treatment	2-
151) Agarwal et al. 2015b	Observational retrospective	General	2 337	Re-classification by ADA, CDA 2003/2013 and WHO 1999 criteria	75g GTT IADPSG	Mismatch of GDM diagnosis	-Use of IADPSG increases preva-lence by 1.5-4.9 times -Closest match of IADPSG with CDA 2013	Non-permissive extrapolation of criteria achieved in different populations	2-
152) Trujillo et al. 2015	Observational retrospective	General (Brazil)	4 926	Virtual variation of IADPSG cut-offs	75g GTT Strict adherence to IADPSG	Relative risk of LGA and preeclampsia	Use of alternative criteria produces only small out-come changes	Historic data collected without strict diagnostic criteria	2-
153) Zhu et al. 2015	Observational retrospective	General (China)	17 186	75g GTT WHO 2013	WHO 1999	GDM prevalence	Slightly higher detection rate with WHO 2013 Patients identified by each criterion are not identical	Retrospective re-analysis	2+

154) Kong et al. 2015	Observational retrospective	General (2 excerpts of national registry)	23 211 22 397	75g GTT (IADPSG criteria)	50g GCT ± 100g GTT (CC criteria)	GDM prevalence Pregnancy outcomes	-19% increase with IADPSG -Similar out-comes -Higher neonatal hypoglycemia with IADPSG		2++
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
155) Egan et al. 2014	Observational retrospective	General	4 435	75g GTT (IADPSG)	75g GTT (WHO 1999)	GDM prevalence	3.4% can be re-categorized to non-GDM under IADPSG criteria	Retrospective re-analysis	2+
156) Harrison et al. 2015	Observational retrospective	GDM risk	224	FG & lipids at GW 12-15	2-step ADIPS or 1-step IADPSG at GW 24-28	GDM prevalence	Diagnostic rates IADPSG>ADIPS Early FG is pre-dictive of GDM risk	Retrospective Single center	2+
157) Liu et al. 2015	Observational retrospective	Twin pregnancy (China)	1 461	2-step screening by CC criteria	1-step by IADPSG	GDM prevalence Perinatal outcomes	Diagnostic rates IADPSG 20.4% , CC 7.0% IADPSG lowers preeclampsia risk by 38%	Retrospective Single center	2+
158) Wei et al. 2014	Observational retrospective	General (China)	25 674	2-step screening by IADPSG criteria	2-step screen by NDDG criteria with 75g glucose load	GDM prevalence Perinatal outcomes	IADPSG 18.9% NDDG 8.4% NDDG is asso-ciated with higher rates of adverse outcomes	Retrospective Single center Screening method modification	2+
159) Mohan et al. 2014	Cross-section cross-over design	General (India)	1 031	75g GTT at non-fasting state DIPSI criteria	75g GTT at fasting state WHO 1999 IADPSG	GDM prevalence	-Non-fasting test is insensitive -DIPSI criteria miss > 70% cases -Assessment cri-teria show diffe-rent risk aggre-gation	Non-random cross-over No data on peri-natal outcomes	2++

160) Trujillo et al. 2014	Observational retrospective	General (Brazil)	4 926	Fasting PG as part of GTT	75g GTT 2h	Predictive power of fasting PG cut-off	FPG at cut-offs of >92, 80-85 and <80 identifies reliably GDM, need for GTT and healthy patients	Retrospective design No adjustment for confounders	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
161) Lindquist et al. 2014	Cross-section	General	184 183	Universal 75g GTT 2h	Selective 75g GTT 2h with cut-offs 8.9, 10 and 12.2	GDM prevalence	-Highest GDM rates in selective screening using cut-off 8.9 mM -IADPSG use re-commended		2++
162) WHO 2014	Guideline					GDM diagnostic criteria and cut-offs	Recommendation of IADPSG		?
163) Liao et al. 2014	Observational retrospective	General (Han-Chinese)	5 360	Re-classification by IADPSG criteria	2-step screen by ADA criteria	GDM prevalence	Use of IADPSG criteria increases rate by 200% No association with altered peri-natal morbidity	Retrospective design Single ethnicity	2+
164) Claesson et al. 2013	Observational retrospective	GDM diagnosis in 1996-1999	120	Re-classification by IADPSG criteria	EASD and WHO criteria	GDM diagnosis confirmation	Diagnosis confir-mation by IADPSG 84% WHO 80% EASD 67%	No FG data Retrospective design	2-
165) Tian et al. 2013	Meta-analysis of published studies	General (China)	2 812 GDM 5 918 cont.	HBA1c	other methods (n.a.)	Diagnostic accuracy of HbA1c	Sensitivity 76% Specificity 92% Useful for confir-mation, but not alone	Full text non-accessible Ill-defined analysis method Pooled data	2-
166) Anderson et al. 2013	Observational prospective	Positive GCT	888	Fasting capillary glucose (FCG)	GTT	Predictive power of FCG	-FCG correlates GTT data and in-sulin sensitivity -FCG alone can-not rule out GDM	Full text non-accessible	2+
167) Vandorsten et al. 2013	NIH consensus conference					Diagnostic approach recommendations	Pro- and Con-arguments on pp. 95-106		?
168) Donovan et al. 2013	Meta-analysis of data bases	General				Comparison of GDM screening tests	GCT and FPG are suitable for GDM exclusion	Verification bias Diagnostic review bias	1+

							HbA1c is not use-ful for screening		
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
169) Tran et al. 2013	Prospective Cross-section	General (Vietnam)	2 772	75g GTT at GW 24-32	Assessment by ADA, WHO, IADPSG and ADIPS	GDM prevalence Predictive power of individual approaches	ADA 5.9% IADPSG 20.4% ADIPS 20.8% WHO 24.3% Selective test by ADA criteria recommended	Single hospital center: data not transferable to general population	2++
170) Cosson et al. 2013	Observational longitudinal survey	GDM risk factors	18 775	Selective 1-step 75g GTT and FG		GDM prevalence over time GDM-related events Risk factor prevalence over time	Prevalence stable at 14.4% Risk factor preva-lence increases over time Selective scree-ning misses 30% of cases, revealed by GDM-related events Selective strategy not recommended	Multiethnic population Variable treatment of GDM cases	2++
171) Hartling et al. 2012	Meta-analysis of data bases and published literature					Comparison of screening approaches and thresholds	-No clear thre-sholds for GDM risk with 75/100 GTT identified -50g GCT has va-riable positive predictive value		1++
172) Göbl et al. 2012	Observational prospective	GDM risk	1 336	FPG	75g GTT IADPSG	Validation of GDM risk prediction model	-FPG recommen-ded as sufficient first step in risk patients	Poor specificity of risk estimation model	2+
173) Mission et al. 2012	Virtual analysis	General	100 000 virtual cohort	GTT 2h	GCT ± GTT	Diagnostic efficacy Cost of GDM-related adverse outcomes	-GTT screening is more effective and expensive	Virtual analysis based on hetero-geneous studies	2+

							-IADPSG is cost-ineffective when GDM is found in >2% new patients	Results reliable only for some perinatal outcomes	
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
174) O'Shea et al. 2012	1)Explorative 2)Retrospec-tive analysis	1) Healthy pregnant and non-pregnant 2) General, pregnant	1) 311 2) 5 208	HbA1c in each trimester	GTT 2h IADPSG	1) HbA1c trimester reference values 2) Correlation of HbA1c and GTT data	-Sign. decreases of HbA1c in 1st and 2nd trimester -HbA1c in 2nd tri-mester identifies 46% of GTT-diagnosed GDM	Full text non-accessible Recommendation of HbA1c use non-substantiated by the results	2-
175) Gillespie et al. 2012	Virtual analysis	General (national registry)	+ 5 000	Screening by IADPSG criteria		Costs for screening and subsequent GDM treatment/care	-Average cost of detection 351€ -Average cost of detection and treatment 9 325€	Full text non-accessible	2-
176) Corrado et al. 2012	Observational retrospective	General	738	FPG 1st trimest.	75g GTT in early 3rd trim.	Correlation between FPG and GTT data	FPG >5.1 but <7.0 has no dia-gnostic, but pre-dictive value	No standard FPG protocol No adjustment for risk factors	2-
177) Wendland et al. 2012	Meta-analysis of published studies		44 829	IADPSG criteria	WHO criteria	Association of GDM diagnosis with adverse outcomes	-Similar degree of association -Higher inconsis-tency with IADPSG criteria	Exclusion of studies reporting on untreated patients	1++
178) Sacks et al. 2012	Observational retrospective	General multiethnic	23 957	75g GTT at GW 24-32 IADPSG criteria		GDM prevalence	-Average prevalence 17.8% -Substantial bet-ween-center variability	HAPO study	2++
179) Verhaeghe et al. 2012	Observational prospective	GDM risk (abnormal GCT)	353	HbA1c at GW 24-32	100g GTT 3h IADPSG	Correlation of HbA1c with indices of insulin sensitivity	-Strong associa-tion with insulin sensitivity -Variability with ethnicity and ges-tational age	No direct measu-rement of insulin sensitivity (eu-glycemic clamp)	2-

180) Szoke et al. 2012	Retrospective audit	General	298	50g GCT ± 100g GTT	75g GTT	Compliance with IADPSG protocol	Test protocol violated in 23%	Non-applicable to general population	2-

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
181) Balaji et al. 2012	Observational prospective	General (India)	819	75g GTT 2h Capillary blood	75g GTT 2h Venous blood	Sensitivity and specificity of capillary plasma measurement	-Sensitivity 80% -Specificity 98%	Full text non-accessible Single center	2+
182) Gandhi & Farrell 2011	Retrospective data review	Gravidae with BMI>40	190	75g GTT at GW 20	75 GTT at GW 28	Proportion of GDM diagnosed at GW 20 and 28	-70% GDM cases diagnosed at GW20 -2h glucose <6 at GW20 precludes GDM diagnosis at GW28	Retrospective Missing informa-tion on other risk factors Only Caucasians	2+
183) O'Sullivan et al. 2011	Observational retrospective	General	5 500	75g GTT IADPSG criteria	75g GTT WHO criteria	GDM prevalence Association with adverse outcomes	-WHO 9.4%, -IADPSG 12.4% More adverse outcomes in patients missed by WHO, but GDM-diagnosed by IADPSG		2++
184) Moses et al. 2011	Observational prospective	General (Australia)	1 275	75g GTT IADPSG criteria	75g GTT ADIPS criteria	GDM prevalence	-ADIPS 9.6% -IADPSG 13%	No data on ethnicity	2+
185) Gandevani et al. 2011	Observational prospective	General (Iran)	1 804	50g GCT 1h	100g GTT 3h	Cut-off value for GDM diagnosis	1h GCT cut-off at 135 mM yields 95% sensitivity and 80% specifi-city	Conclusions limited to Iranian population	2+
186) Kurtbas et al. 2011	Prospective observational	General	200	Repeated 2-step testing at GW 24-28 and 30-34		GDM incidence beyond GW 28	Additional 5% diagnosed in late pregnancy	Small sample	2+
187) Gao et al. 2010	Observational retrospective	Positive GCT	4 179	75g GTT 2h ADA criteria	75g GTT 3h ADA criteria	GDM prevalence with omission of 3h value	Omission of 3h value results in overlooking 10% of GDM cases	Full text non-accessible	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
188) Bugallo et al. 2011	Observational retrospective	General (Spain)	12 084	GDM screening (no details)		Importance of protocol non-compliance	30% of potential GDM cases are missed with 10% non-compliance	Full text non-accessible Details of test protocol non-available	2-
189) Flavigna et al. 2013	Simulation study	Hypothetic cohort with 10% GDM prevalence	n.a.	Screening by IADPSG criteria	Screening by WHO 1999 criteria	Impact on adverse outcomes	IADPSG criteria result in higher reduction of LGA and preeclampsia incidence	Imperfect simu-lation parameters Indirect evidence	?
190) Round et al. 2011	Cost-efficacy analysis	Data from published studies	n.a.	Screening by FPG, random PG or GCT ± GTT (or GTT alone)		Cost-effectiveness	-None with GDM risk <1% -At risk of 1-4.2% FPG+GTT is cost-effective -Universal GTT is cost-effective	-Virtual model -Selection bias -Reporting bias -Effect of diffe-rent approach acceptance not considered	2+
191) Agarwal et al. 2010	Observational retrospective	General (Emirates)	10 283	75g GTT IADPSG criteria	75g GTT ADA criteria	GDM prevalence Predictive thresholds for FPG	-IADPSG 37.7% -ADA 12.9% -FPG <4.4 rules out GDM; >5.1 predicts GDM -Sign. ethnic dif-ferences in ADA	Retrospective design	2+
192) Retnakaran et al. 2009	Observational prospective	General	412	Universal 50g GCT and 100g GTT 3h (NDGG criteria)		Predictive power of FPG and 1,2,3h values for adverse outcomes	-Only FPG predicts LGA -All post-load values predict post-partum DM	-No adjustment for treatment -Subgroup analysis	2+
193) Harper et al. 2016	Observational retrospective	GDM diagnosis	958	NDDG and CC criteria	CC criteria only	Interaction between diagnostic criteria and treatment on adverse outcomes	No significant effect of diagnostic criteria on treatment direction	Retrospective approach	2+

8.0 Therapy - Fetal growth

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
1)Constantine et al. 2013	Observational retrospective	Mild GDM	2 083	LGA assess-ment by po-pulation norm	LGA assess-ment by cus-tomized norm	Composite neonatal outcome	-None of the norms shows superiority in identifying neonatal adverse outcomes	-Incomplete adjustment of population norms for confounders	2+
2)Landon et al. 2009	RCT	Mild GDM	900	Diet Insulin (on demand)	Standard care	Composite neonatal outcome	-Treatment reduced risk of fetal over-growth, but not com-posite outcome	No glycemic monitoring in controls	1++
3)Guillen et al. 2014	Observational retrospective	Twin pregnancy	272	GDM Diet Insulin (on demand)	No GDM Standard care	LGA incidence	-GDM does not increa-se LGA in twins -Glycemic control intervention does not affect outcomes	-High proportion of assisted repro-duction (GDM)	2+
4)Sovio et al. 2016	Observational prospective	General primiparae	4 069	-Ultrasound at GW 20 + 28 -GDM testing at GW 28		Fetal growth before GDM diagnosis	-GDM diagnosis is preceded by excessive fetal growth after GW 20	Full text non-accessible	2+
5)Ethridge et al. 2014	Observational retrospective	General	8 390	GDM by CC criteria	GDM by IADPSG	Fetal growth and BW	-GDM diagnosis by IADPSG is associated with greater fetal overgrowth	Included premature deliveries	n.a.
6)Schäfer-Graf et al. 2011	Observational prospective	GDM by CC criteria	1 914	Ultrasound exams in 3-4 week intervals		Number of ultra-sound exams needed to exclude LGA risk	LGA can be excluded if 2 consecutive exams show abdominal circumference below the 90th percentile	Attrition bias	2++
7)Culliney et al. 2016	Meta-analysis of accessible RCT	GDM		Fetal surveillance for LGA		Surveillance regime recommendation	No relevant RCT available		1++

8.1 Therapy - Weight management

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
1)Casey et al. 2015	Secondary analysis of RCT	Mild GDM	958	Diet Insulin (on demand)	Standard care	-LGA -Fetal fat mass -C-reactive protein	-Treatment effect on fetal growth depends on maternal BMI	-Low presence of morbid obesity	1+
2)Barnes et al. 2013	Observational retrospective	GDM by ADIPS criteria	1 695	Diet Insulin (on demand to achieve target FBG)	none	-LGA predictors	-pre-treatment weght gain, pre-pregnancy BMI, post-treatment weight gain, treatment modality -FBG-targeted therapy should be supported by weight management	-Self-reported pre-pregnancy BW -No data on efficacy of glycemic control -Incomplete ad-justment for con-founders	2+
3)McGiveron et al. 2015	Case-control	Gravidae BMI>35	178	Diet counseling	Standard care	-Weight gain -Adverse maternal outcomes	-Weight gain reduction is associated with redu-ced hypertension risk and less pregnancy complications	Small sample No adjustment for effect of persona-lized care	2+
4)Harrison et al. 2013	RCT	GDM risk at GW 10	228	4 sessions of dietary advise	Written information	Gestational weight gain at GW 28	-14% less weight gain in intervention group -Effect best appreciated in overweight patients -No impact on GDM incidence	-Differential ethnic-related efficacy	1+
5)Syngelaki et al. 2016	RCT	Gravidae BMI>35 No GDM	400	Metformin from 12-18 GW onwards	Placebo	Neonatal BW-z score LGA incidence	-Treatment reduces maternal weight gain, but not neonatal birth weight	Full text non-accessible	1+
6)Bogaerts et al. 2015	Observational retrospective	Gravidae BMI>30	18 053	Gestational weight loss	Weight gain	Maternal and neonatal adverse outcomes	-Weight loss is asso-ciated with decreased perinatal adverse outcomes -Benefits depend on the class of obesity	No data on cause for weight loss Retrospective design	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
7)Kinnunen et al. 2012	Re-analysis of RCT	GDM risk	399	5x individual counseling on GWG, dietary advise from GW 12-18	Standard care	Total and weekly GWG	Minor non-significant effect of intervention	Possibly insuffi-cient power 12-14% dropouts Poor adjustment for confounders Self-reported pre-pregnancy weight	1-
8)Asbee et al. 2009	RCT	General gravidae	100	Diet and lifestyle counseling	Standard care	Proportion of high GWG	-Intervention signifi-cantly reduced GWG and adverse outcomes -Pre-pregnancy BW predicts treatment effect	-Small sample -Presumable Hawthorne effect Selection bias	1-
9)Muktabhant et al. 2015	Meta-analysis of RCT			Diet Lifestyle Diet+lifestyle		-Reduction of excessive GWG -Adverse pregnancy and perinatal outcomes	-Each intervention or both together can reduce GWG -Decreased risk of Caesarean delivery and macrosomia		1++
10) Muktabhant et al. 2015	Meta-analysis of RCT							Earlier version of # 10	n.a.

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(166) Chamberlain et al. 2015	Meta-analysis of observational studies	Pregnancy; no precise time point	ca. 4 million	Various GDM criteria and screening protocols		Prevalence of GDM	-Universal screening increases GDM prevalence -Firm diagnostic criteria increase data consistency	Poor information on diagnostic criteria Highly heterogeneous subgroups	2-
(167) Macaulay et al. 2014	Meta-analysis of observational studies	24-36 GW	Several thousand	Mostly 75g GCT and WHO criteria		Prevalence of GDM	-Highly variable prevalence -Strong national differences	High risk of bias Variable time points	n.a.
(168) Tieu et al. 2014	Meta-analysis of randomized and quasi-randomized studies	26-32 GW	3400 to 30	Different GCT protocol Different glucose formulations	Universal screening with 50g OGCT	-Detection of GDM -Maternal and neonatal outcomes	-Universal screening detects more GDM -Infants to mothers at risk are born earlier	Comparator study in high-risk population Highly divergent sample sizes Variable endpoints	1-
(169) O'Dea et al. 2014	Trial protocol								n.a.
(170) Cosson et al. 2014	Observational prospective	General population Ethnic subgroups	+17 000	Universal screening 75g GCT WHO criteria	none	-Association of French risk factors with GDM-related adverse outcomes (pre-eclampsia, dystocia, macrosomia) -Ethnic distribution of association	-Association confirmed in the presence of at least 1 risk factor -Association not applicable to Asians -Universal scree-ning regardless of ethnicity recommended	Caucasian ethnic subpopulations excluded Underrepresented subgroups Within-subgroup heterogeneity ignored	2+
(171) Yeral et al. 2014	RCT	First trimester	486	50g GCT (CC criteria) 75g GTT (ADA criteria)	FG	-Sensitivity -Specificity	-ADA > CC > FG -ADA = CC > FG	Full text non-accessible High attrition bias	1-

							-75g GTT recom-mended for scree-ning in 1st trim.		

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(172) Goldberg et al. 2013	Prospective observational	Negative GCT in 2nd trimester	200	OGTT	50g GCT	-Predictors of false-negative GCT result	-higher GCT glucose value -no predictive threshold	Full text non-accessible	2-
(173) Prutsky et al. 2013	Meta-analysis of RCT and observational studies		+87 000	50g GCT Carpenter NDDG FG		-GDM yield (prevalence) -Sensitivity -Specificity -Association with outcomes	GCT>CC>NDDG -no data for CC and NDDG (!!!) -association with gest. hypertension and macrosomia -No comparisons of feto-maternal outcomes with and without screening -Low quality of evidence in sup-port of screening		1++
(174) Tian et al. 2013	Meta-analysis (study type not specified)	Chinese	+2800 cases +5800 cont.	HbA1c test	not specified	-Sensitivity -Specificity -Likelihood ratios	-76% -92% Useful for GDM confirmation	Full text non-accessible No information retrievable	2-
(175) Benaiges et al. 2013		Post-partum with GDM history						Full text non-accessible	n.a.
(176) Helseth et al. 2013	Post-hoc analysis of single RCT	PCOS at GW 5-12	273	IADPSG	WHO	-GDM prevalence	-IADPSG>WHO only in 1st trim. -increasing with gestational age		1+

						-Risk factors for GDM at 1st trim., 19 and 32 GW	-differ between criteria -weight gain is indep. predictor		
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(177) Sevket et al. 2014	RCT		786	75g OGTT (IADPSG)	50g GCT plus 100g OGTT (C&C)	-GDM prevalence -clinical outcomes	-IADPSG > C&C -diagnosis by IADPSG criteria is associated with more favorable outcome	Full text non-accessible	1-
(178) Lobo et al. 2013	Meta-analysis of case-control studies	GDM (any criteria) Controls	~300 GDM ~250 contr.			-Resistin (serum) as GDM biomarker	-No significant difference between GDM and controls	Small samples Different times Poor statistics	2-
(179) Tomic et al. 2013	Observational prospective(?)	Women at GDM risk	1002	75g OGTT		-Association of maternal glycemia with adverse outcomes	-LGA, NICU stay, hyperbilirubinemia and Cesarean are associated with higher maternal glycemia	Full text non-accessible	2-
(180) Ma et al. 2013	Secondary analysis of observational study	24-30 GW Glucose <120 at 1h in 50g GLT	436	50g GLT 1h 90-120	50g GLT 1h value < 90	maternal -weight gain -Caesarean -pre-eclampsia neonatal -gest. age at delivery -LGA -NICU admission -hyperbilirubinemia -hypoglycemia	 -no diff. -no diff. -no diff. -no diff. -no diff. -no diff. -no diff. -↓ in <90-group Rate of neonatal hypoglycemia proportionally increases with maternal GLT values	By-product of therapeutic study Disproportional Hispanic presence	2+

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(181) Hartling et al. 2012	Meta-analysis of RCT, pro- and retrospec-tive cohort studies	General population GDM-risk populations	Several thousand	Different screening protocols		Maternal and neonatal outcomes in GDM	-Aberrant 75g or 100g OGTT is associated with macrosomia and Caesarean section. -50g GCT has high negative predictive value and variable positive predictive value		1++
(182) Syed et al. 2012	Meta-analysis of literature Irrelevant study type or intervention	GDM	+1000 (?)	Different screening protocols (not primary focus)		Stillbirth incidence	-Inconclusive data -Presumed decrease by 10% with intensive management -No RCT comparing early vs. standard (GW 24-28) approach	Poor quality of most studies No specific focus on diagnostics	2-
(183) Waugh et al. 2010	Meta-analysis of literature	GDM		Screening protocol Time of screening Threshold of intervention			-Early screening may not distin-guish DM2 and GDM -HbA1c useful for pregestational DM -No method of high excellence -FG is as good as any other -Poor correlation between fasting and post-load BG -Selective screening recommended for risk populations	Search period 2002-2009	1++

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(184) Tieu et al. 2010	Meta-analysis of RCT and quasi-random studies							Update as # 9	n.a.
(185) Meltzer et al. 2010	Prospective RCT	24-28 GW	1500	Two-step (A) 50g GCT + 100g 3h GTT Two-step (B) 50g GCT + 75g 2h GTT	One-step 75g 2h GTT	-GDM prevalence -Cost	-similar between groups -higher in one-step protocol -Two-step method (B) resommended for universal screening	-Only partial BMI records	1++
(186) Clark et al. 2009	RCT	History of GDM	+200	Postal reminders for DM2-testing	No reminder	Compliance rate	Higher compliance with reminders sent to patient and physician	Postpartal monitoring Inequal groups	n.a.
(187) Sacks et al. 2015	Retrospective cohort	GDM OR 2.0 after IADPSG criteria, but not treated	+9800	GDM OR 2.0 (1) GDM OR 2.0, but below treatment threshold (2)	no GDM	Adverse outcomes -Birth weight -LGA -pre-eclampsia -Caesarean -dystocia -LGA -Birth weight -neonatal hypoglycemia	GDM(1)>no GDM GDM(1)>no GDM GDM(2)>no GDM GDM(2)>no GDM GDM(2)>no GDM GDM(2)>no GDM GDM(2)>no GDM GDM(2)>no GDM GDM(2)>no GDM	Predominant Latino ethnicity Insufficient power at some endpoints	2++
(188) Serlin & Lash 2009	Expert opinion						Diagnostic, treatment and		4

							monitoring recommendations		
(189) Flack et al. 2010	Retrospective data analysis	26-28 GW universal screening	+3500	IADPSG criteria	ADIPS criteria	Professional workload	Implementation of IADPSG criteria results in increase of staff workload by 22 to 31 %	Heterogeneous sampling frames Regional diversity Imprecise endpoint definition	2-

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(190) Nwose et al. 2013	Retrospective data analysis	Antenatal screening	615	IADPSG criteria	ADIPS criteria	Prevalence	Implementation of IADPSG criteria results in increase of prevalence by yearly 10.8%, thus increasing GDM cases by 46%	Gest. age of testing not indicated.	2-
(191) Ryan 2010	Expert opinion	Antenatal screening		IADPSG criteria			Recommendation: -50g GCT at 24-28 GW -1h > 11.1 = GDM -1h 7.8-11.0 require 75g OGTT 1h <7.8 =no GDM		4
(192) ADA 2016	Expert opinion (?) Guideline (?)	Antenatal screening					Recommendation: -75g OGTT at 24-28 GW (FG,1h,2h) or -50g GCT; if 1h> 140, proceed with -100g OGTT		?
(193) Simmons et al. 2010	Guideline comparison	Antenatal screening		ADA ACOG	NICE		Marked guideline divergences as of -population		4

	Expert opinion						-risk definition -protocol -criteria -management -delivery		
(194) Donovan et al. 2013	Systematic review of cohort studies	Antenatal screening	32 to +9000	FG HbA1c (various criteria)	50g GCT (various criteria)	Sensitivity Specificity Likelihood ratios	FG and GCT can exclude GDM HbA1c is inferior to GCT and FG	Verification bias Diagnostic bias Applicability concerns	2++
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(195) Berggren et al. 2011	Retrospective cohort study	Screening 50g GCT + 100gOGTT	+4600	NDDG criteria	Carpenter-Coustan	-Prevalence -Adverse outcomes	-CC detect 42.5% more cases -Pre-eclampsia and hypertension more frequent with CC -Length of NICU stay higher with NDDG		2++
(196) Hartling et al. 2014	Systematic review of outcome-containing studies	Antenatal screening	n.a.	Various protocols and diagnostic criteria		Association of adverse outcomes with test used (risk estimate)	-higher thresholds do not always show greater risk for all outcomes -continuous relationship of glucose levels and macrosomia (not IADPSG) and Caesarean rates -HAPO 2.0 worthy consideration	Mutually exclusive patient groups	1+
(197) van Leeuwen et al. 2012	Systematic review of cohort studies (no case-control)	Screening before GW 32		OGTT 75 or 100g	50g GCT	-Sensitivity -Specificity -Likelihood ratios	-GCT is acceptable for screening, but cannot replace OGTT		2++

							-combination with other protocols recommended		
(198) van Leeuwen et al. 2010	Systematic review of cohort studies	Screening before GW 32	+3 500	Random glucose test	OGTT	-Sensitivity -Specificity	Single random glucose test is not adequate screening tool	Verification bias	2+
(199) Miailhe et al. 2015	Observational retrospective	Universal screening	2 187	75g GTT IADPSG criteria	Re-evalua-tion by selec-tive screening criteria	-GDM prevalence -LGA incidence	-14% total; only 2.4% without risk -LGA higher in GDM with risk	Retrospective design Underpowered subgroups	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(200) Tieu et al. 2014								Corresponds to #9	n.a.
(201) Farrar et al. 2015	Meta-analysis of RCT	Antenatal screening	694	75g OGTT WHO criteria	100g OGTT ADA criteria	-Positive GDM diagnosis -Mode of delivery -Macrosomia	-75g > 100g -no diff. between WHO and ADA -no diff. -no diff.	High attrition bias Small individual trials Ethnic variability	1+
(202) Whitworth & Dowswell 2009	Meta-analysis of RCT and quasi-random trials	General population in reprod. age	2300	Routine pre-pregnancy health promotion	No health promotion	-Prenatal death -SGA -Extremely preterm birth -Maternal death		No specific consideration for GDM	n.a.

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
194) Luoto et al. 2011	Cluster-RCT	At least one GDM risk factor	399	Counseling on physical acti-vity and diet	Standard care	Neonatal birthweight adjusted for gestational age	Lower neonatal birth-weight and LGA in inter-vention group	Presumed data inaccuracy No assessment of glycemia close to delivery	2+
195) Matarrelli et al. 2013	RCT	Elevated FG in 1st trim.	75	Myo-inositol	Placebo	Incidence of GDM Neonatal outcomes	Lower GDM rate Lower birthweight Lower incidence of fetal hypoglycemia	Full text non-accessible Small sample	1-
196) Ehrlich et al. 2012	Observational retrospective	Gravidae with any diabetes	288 009 mother/infant pairs			Neonatal sex	-GDM with highest M/F ratio -Pre-gravid diabe-tes with lowest M/F ratio		2++
197) Landon et al. 2011	Observational retrospective	Untreated GDM with different degrees of glycemia	1 877	FG 50g GCT 75g GTT 3h		Adverse neonatal outcomes (composite)	Monotonic rela-tionship between degree of glyce-mia and perinatal morbidity	Reporting bias (abnormal GCT as cut-off)	2++

8.2 Therapy - Glycemic management

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
11) Mirzamora di et al. 2015	RCT	General	189	Diet/exercise with GDM diagnosed by single abnormal value IADPSG	Diet/exercise with GDM diagnosis by ACOG criteria	Adverse maternal and neonatal outcomes	Beneficial treatment effect only on neona-tal hyperbilirubinemia	Small sample Between-groups differences in medical history	1-
12) Zawijeska et al. 2014	Observational retrospective	GDM diagno-sed by WHO criteria	492	Re-assessment of glycemia by IADPSG crit.		Adverse maternal and neonatal outcomes	High FBG is associa-ted with high birth weight, need for insu-lin and poor metabolic control	Full text non-accessible Retrospective design	2-

13) Deveer et a. 2013	RCT	Positive GCT and negative GTT (ACOG)	100	Dietary advice	Nutrition ad libitum	Birth weight, LGA, gestational weight gain, macrosomia	Significant treatment effects on each endpoint	Small sample	1-
14) Durnwald et al. 2011	Secondary analysis of RCT	Mild GDM	460	Diet	Standard nutrition	-Normalization of fasting and post-prandial glycemia -Adverse outcomes	-Glycemic targets achieved in 92% -High FBG at therapy start is associated with higher fetal fat mass High FBG during last 2 weeks before deli-very is associated with LGA and macrosomia		1+
15) Rowan et al. 2010	RCT	GDM	724	Metformin	Insulin	Association of ab-normal glycemic parameters and adverse outcomes	-Capillary glucose values predict adverse outcomes, if FPG >4.9 and 2h-postprandial is below 5.9-6.4		1++
16) Gojnic et al. 2012	RCT???	Impaired glycemic control	280	Diet + insulin	Diet alone	Glycemic control Hypertension Birth weight Caesarean rate	-improved by insulin -decreased by insulin -no significant effect -decreased by insulin	Full text non-accessible	???

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
17) Tward et al. 2016	Observational retrospective	Twins with GDM and different degrees of glycemic impairment	1 393	-GDM IADPSG -GDM CDA -GTT-negative	GCT-negative	Asymmetric growth	Enhanced risk of asymmetric growth proportional to degree of glycemic impairment	No adjustment for confounders Unequal sub-group strength	2+
18) Fadl et al. 2015	RCT	Hyperglyce-mia (but not GDM)	69	Diet ± insulin	Standard care	LGA rate	Decreased by treatment	Small sample Descriptive data	1-
19) Kokanali et al. 2014	RCT	One abnormal 100g GTT value (CC criteria)	248	Caloric diet	Standard care Control group normal GCT	Adverse maternal and neonatal outcomes	Treatment reduced LGA and macrosomia	Full text non-accessible	1+
20) Ibrahim et al. 2014	RCT	Gravidae with GDM or pre-existing DM	90	Metformin and standard insulin dose	Insulin alone at variable doses	Glycemic control	Better effect of add-on metformin	Small sample Small subgroups Heterogeneous etiology	n.a.
21) Han et al. 2012	Meta-analysis of RCT	Gravidae with hyperglyce-mia, but no GDM or DM	521	Dietary advice Glucose monitoring		Adverse perinatal outcomes	Reduced rates of LGA and macrosomia	Studies with high bias risk	1+
22) Alwan et al. 2009	Meta-analysis of RCT	GDM	1 418	Any treatment strategy	Standard care	Adverse perinatal outcomes	Significant reduction of pre-eclampsia, macrosomia and perinatal morbidity. No significant diffe-rence between insulin and oral antidiabetic treatment.		1++
23) Martis et al. 2016	Meta-analysis of RCT	GDM	180	Strict vs. liberal targets of glyce-mic control		Adverse perinatal outcomes	No clear differences	Unclear bias risk Small sample Report on secon-dary outcomes	1-

8.3 Therapy - Lifestyle interventions

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
1)Oostdam et al. 2012	RCT	Obese gravidae	121	Exercise in the 2nd and 3rd trimester	Standard care	Glycemic control Insulin sensitivity Birth weight	No significant effect of intervention	Drop-out >20% Low compliance Inappropriate training intensity	1+
2)Wang et al. 2015	RCT	GDM (China)	84	Fat-rich diet, caloric control	Low-fat diet, caloric control	Glycemic control Pregnancy outcome	-improvement in both groups -no significant effect	Small sample No real control	1-
3)Hu et al. 2014	RCT	GDM (China)	140	Low glycemic index staple diet for 5 days	Standard staple diet	Glycemic control	Sign.improvement, FBG decrease also in the control group	Full text non-accessible Short intervention Small sample	1-
4)Fei et al. 2014	RCT	GDM (China)	97	Soybean oligosaccharides and insulin for 8 weeks	Insulin alone	Antioxidant enzymes Insulin resistance	Sign. improvement of insulin resistance Reduced insulin need	Small sample No demographic comparison	1+
5)Hernandez et al. 2014	Randomized cross-over	GDM obese	16	High complex carbohydrate, low fat diet 2x for 3 days	Low carbohydrate high fat diet 2x for 3 days	Glycemic control	Adequate glycemic control can be achieved with high complex carbohydrate/low fat diet	Very small sample Short intervention Obese patients	1-
6)Dodd et al. 2014	RCT	Gravidae BMI>25 singletons	2 212	Dietary and lifestyle counseling	Standard care	LGA Birth weight >4000 Maternal outcomes	-no significant effect -reduced incidence -no significant effect	Study population precludes generalization Poor compliance	1+
7)Perichart-Perrera et al. 2009	Interventional prospective	GDM or DM2	108	Counseling, self-monitoring	Standard care (historic control)	Adverse maternal and neonatal outcomes	Lower risk of eclampsia, maternal hospitalization and neonatal death	Inadequate control group Heterogeneous population	1-
8)Moses et al. 2009	RCT	GDM	63	Low glycemic index diet	Conventional high-fiber diet	Insulin requirement	Reduced need for insulin	Small sample	1+
9)Asemi et al. 2015	RCT	GDM	70	Magnesium 250 mg/d over 6 days	Placebo	FPG HOMA-IR Neonatal outcomes	-improvement -improvement -reduced hyperbilirubin-emia	Small sample Adjusted plasma Mg levels not different	1-

								Probable type I error	
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key result**	**Flaws/Bias**	**LoE**
10) Bo et al. 2014	RCT 2x2	GDM	200	Diet, exercise and/or behavioral advice		Glycemic control	Daily 20 min walk improves glycemic and metabolic control (no effect on FBG) No additional effect of combination with diet	Underpowered No compliance control	1+
11) Asemi et al. 2013a	RCT	GDM	32	DASH diet for 4 weeks	Random diet	FPG, Insulin, HOMA-IR	Significantly decreased FPG, insulin and HOMA-IR score	Underpowered Short intervention Subjective compliance control	1-
12) Asemi et al. 2013b	RCT	GDM	34	DASH diet for 4 weeks	Random diet	-3h GTT profiles -Perinatal outcomes	-Sign. improvement at all time points -Decreased insulin need -Reduced cesarean rates	Underpowered Short intervention Subjective compliance control	1-
13) Corrado et al. 2011	Nested RCT	GDM	69	Myoinositol + folate over 8 weeks	Folate only	-HOMA-IR -Adiponectin	-Improved in both arms -Increased in treatment group	Underpowered Questionable statistics	1-
14) De Barros et al. 2010	RCT	GDM	64	Resistance exercise from GDM diagnosis to the end of pregnancy	No exercise	Need for insulin treatment	-Decreased in treatment group	-Small sample -Subjective load control -Subjective compliance control	1-
15) Ma et al. 2015	RCT	GDM (China)	83	Intensive low glycemic load diet over 10-12 weeks	General dietary intervention	Glycemic control Serum lipid profiles	Stronger improvement with low glycemic load diet	Underpowered Open label design Monoethnic Reporting bias	1-
16) Barakat et al. 2013	RCT	GDM (diagnosed after intervention)	102	Resistance and aerobic exercise over 2nd and 3rd tri	Standard care	-GDM-associated adverse outcomes	-Decreased rates of macrosomia and Caesarean delivery	Self-reported pre-pregnancy data No adjustment for dietary habits	1+
17) Jamilian & Asemi 2015	RCT	GDM	68	Soy-rich diet over 6 weeks	Standard diet		-Decreased FPG, insulin, HOMA-IR, triglycerides	Underpowered Folate & Fe co-medication	1+

							Decreased newborn hyperbilirubinemia		

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
18) Lindsay et al. 2015	RCT	GDM	149	Probiotic (Lactobacillus salivarius) for 4-6 weeks	Placebo	FPG	No significant effect	18% drop-out	1+
19) Samimi et al. 2015	RCT	GDM	56	Omega-3-fatty acids over 6 weeks	Placebo	FPG	No significant effect	Underpowered Questionable effect calculations	1-
20) Halse et al. 2014	RCT	GDM	40	Home-based exercise over 5-6 weeks	Conventional care	Glycemic control	Decreased mean daily postprandial PG	Underpowered	1+
21) Deveer et al. 2013	RCT	Positive GCT and negative GTT	100	BMI-tailored diet	Standard care	Adverse maternal and neonatal outcomes	Decreased maternal weight gain, birth weight, LGA and macrosomia	Neonatal assess-ment by different hospital	1+
22) Moreno-Castilla et al. 2013	RCT	GDM	152	Low carbo-hydrate diet	Standard nutrition	-Need for insulin -Pregnancy outcomes	-No significant effect -No significant effect	Ca. 15% drop-out	1+
23) Robinson et al. 2009	Crossover RT	GDM and healthy	27	Caffeine 3mg/kg	Placebo	75g GTT profile	Caffeine impairs insulin sensitivity in GDM, but not in healthy patients	Full text non-accessible Underpowered	1-
24) Han et al. 2013	Meta-analysis of RCT	GDM	429	11 types of dietary advice		Pregnancy outcomes	No significant benefit of a defined diet recom-mendation		1++

8.4. Therapy: Insulin vs. Oral Antidiabetics

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(203) Jiang et al. 2015	Meta-analysis of RCT	Therapy-requiring GDM	+2000	Metformin or Glyburide or Acarbose	Insulin or Metformin	• maternal Glycemic control Weight gain Sectio incidence Pre-eclampsia incidence	 -no difference -Met < Ins -no difference -no difference	none serious Acarbose: only 1 trial with a few patients	1++

						• neonatal Birth weight Macrosomia Hypoglycemia Gestational age at delivery Premature birth NICU admission	-Gly > Ins -Gly > Ins -Gly > Ins -Met < Ins -no difference -no difference		
(204) Poolsup et al. 2014	Meta-analysis of RCT	Therapy-requiring GDM	+2100	Metformin or Glyburide	Insulin	• maternal Postprandial glucose down Sectio risk Pre-eclampsia risk Gest. hypertension risk • neonatal Macrosomia risk Large for gestational age Neonatal hypoglycemia Premature birth Neo/perinatal mortality Shoulder dystocia risk	 Met < Ins -no difference -no difference Met < Ins Met = Ins < Gly -no difference Gly > Ins Met > Ins -no difference Met n.s. lower Met n.s. lower	Performance and selection bias exceed 50 % Partial overlap with Study 1	1++

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(205) Jacqueminet et al. 2010	Meta-analysis of RCT and review of data from non-randomized trials	Therapy-requiring GDM		Metformin or Glyburide	Insulin	as in (1) and (2)	No differences in maternal outcomes Divergent data on risk of sectio and neonatal hypoglycemia OAD toxicity issue	Search period 2006-2010 Most data based on data published before 2009 No specific focus on comparison Several bias	2++
(206) Tieu et al. 2010	Meta-analysis of RCT and quasi-randomized trials	GDM or pregnancy planning with GDM history				• maternal Glycemic control Additional medication need for glycemic control Diabetes complications • neonatal Macrosomia Hypoglycemia	No suitable study addressing the topic	No head-to-head comparison	n.a.
(207) Harlev & Wisnitzer 2010	Review of literature	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Off topic	n.a.
(208) Paglia & Coustan 2009	Review of literature	n.a.	n.a.	Metformin or Glyburide	Insulin	n.a.	Met and Gly are equivalent to Ins in terms of pregnancy outcomes OAD toxicity warning	No full text access Potential reporting bias	4
(209) Cheung et al. 2009	Review of literature	Therapy-requiring GDM	n.a.	Metformin or Glyburide	Insulin	as in (1) and (2)	Insulin is the best and most safe treatment option	Review of data published before 2009	4

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(210) Tertti et al. 2013	RCT	Therapy-requiring, standard-diagnosed GDM	+200	Metformin	Insulin	Large for gestational age Macrosomia	-no difference -no difference Met is a suitable alternative to Ins Fructosamine levels may predict adequacy of Met therapy and need for additional Ins	Open label trial Single center	1+
(211) Beyuo et al. 2015	RCT	Heterogeneous: Pre-existing DM and GDM	104	Metformin	Insulin	Glycemic control	-Met equal to Ins in glycemic control	Escalating Met dose; add-on Ins Different gestational age at enrollment	1-
(212) Zhao et al. 2015	Meta-analysis of RCT	Therapy-requiring GDM	+1500	Metformin	Insulin	• maternal -pregnancy-induced hypertension • neonatal -hypoglycemia -large for gestational age -respiratory distress -perinatal death -phototherapy	-Met safer than Ins -no difference at any endpoint		1++
(213) Bassels et al. 2015	Meta-analysis of RCT	Therapy-requiring GDM	+2500	Glibenclamide or Metformin	Insulin or Metformin	• maternal -weight gain -gest. age at delivery -preterm birth • neonatal -hypoglycemia -higher birth weight -macrosomia	Met better than Ins Met inferior than Ins Gli inferior Gli inferior Gli inferior	Open label trials Inconsistent definitions Publication bias	1+
(214) Carrol & Kelly	Summary of # 11						idem, c.f. #11		n.a.

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(215) Li et al. 2015	Meta-analysis of RCT	Therapy-requiring GDM	+2700	Metformin	Insulin	• maternal -Glycemic control -Pre-eclampsia -Pregnancy hypertension • neonatal -Birth weight -Large for gest. age -Small for gest. age -Hypoglycemia -Hyperbilirubinemia	 -no difference -no difference -lower with Met -lower with Met -no difference. -no difference -lower with Met -no difference	Divergent criteria of need for therapy	1++
(216) Ruholamin et al. 2014	RCT	GDM non-manageable by dietary measures	109	Metformin ± Insulin	Insulin	• maternal -Weight gain -Glycemic control -Pre-eclampsia -Pregnancy hypertension • neonatal -Birth weight -Macrosomia -Small for gest. age -Hypoglycemia -Hyperbilirubinemia -Respiratory distress -Shoulder dystocia -Umbilical art. blood pH	No significant differences at any outcome	Exclusion of Met patients needing add-on Ins Insufficient power in some parameters	1-
(217) Ainuddin et al. 2014	RCT	Confirmed GDM No effect of life style modification	186	Metformin	Insulin	• maternal -Weight gain -Glycemic control -Pre-eclampsia -Pregnancy hypertension • neonatal -Birth weight -Large for gest. age	 -higher with Ins -better with Ins -higher with Ins -no difference -higher with Ins -no diff. -no diff.	High drop-out rate Socio-cultural environment Open label	1+

						-Small for gest. age -Hypoglycemia -NICU stay over 24h -Respiratory distress	-lower with Met -lower with Met -no diff.		
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(218) Thom 2014	Comment								n.a.
(219) Ijäs et al. 2014	RCT follow-up	Children born to mothers with treatment-requiring GDM	97	Metformin	Insulin	At 6, 12 and 18 months -Body weight & height -Ponderal index -Motor, linguistic and social development	At 12 and 18 mo. -Met > Ins -no diff. -no diff.	Small sample No data on breastfeeding duration	1-
(220) Su & Wang 2014	Meta-analysis of RCT	Confirmed GDM	1420	Metformin	Insulin	• maternal -Weight gain -Glycemic control -Cesarean delivery -Pregnancy hypertension • neonatal -Birth weight -Macrosomia -Large for gest. age -Hypoglycemia -NICU admission -Respiratory distress -Birth trauma -Birth defect -Premature birth -Phototherapy	-lower with Met -no diff. -no diff. -no diff -no diff. -no diff. -no diff. -lower with Met -no diff. -no diff. -no diff. -no diff. -higher with Met -no diff.	Outcomes not examined in all trials Variable outcome definitions	1++
(221) Gui et al. 2013	Meta-analysis of RCT	Confirmed GDM	1270	Metformin	Insulin	• maternal -Glycemic control -Weight gain -Gest. age at delivery -Preterm birth -Pregnancy hypertension -Pre-eclampsia	-Met ↓ postprand. -lower Met -lower Met -higher Meth -lower Met -no diff.	Heterogeneous trials Outcomes not always examined	1++

						• neonatal -Birth weight -Large for gest. age -Small for gest age -Hypoglycemia	-no diff. -no diff. -no diff -no diff		
(222) Sullivan 2013	Comment on # 25								n.a.
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention**	**Comparator**	**Primary endpoint**	**Key results**	**Flaws/Bias**	**LoE**
(223) Mesdaghi-nia et al. 2013	Blinded RCT	Neonates of mothers with confirmed GDM	200	Metformin (add-on Ins excluded)	Insulin	• maternal -Glycemic control at delivery -Preterm labor • neonatal -Birth weight -LGA -SGA -Hypoglycemia -Apgar score etc. -Hyperbilirubinemia -Respiratory distress -NICU admission	Met superior -Ins>Met -Ins>Met (n.s.) -no diff. -no diff. -Ins>Met -no diff. -Ins>Met -Ins>Met -Ins>Met	Suspicion of non-compliance	1+
(224) Gatford et al. 2013	RCT	GDM meeting criteria for insulin therapy	180	Metformin	Insulin	At 24 and 36 GW, and 6-8 weeks post partum -Vitamin B12 -Holotranscobalamin -Homocysteine	Decreasing B12 levels with advancing Met treatment duration	Supplemental Ins treatment in 30% Met patients Different folate supplementation	2-
(225) Hickman et al. 2013	RCT	Pregnant patients with existing DM type II or GDM	28	Metformin	Insulin	• maternal -Glycemic control -Hypoglycemia -Weight gain -Gest. age at delivery -Side effects -Satisfaction • neonatal -Birth weight -Neonatal glucose	-no diff. -Met superior -no diff. -no diff. -Met superior -Met preferred -no diff. -no diff.	Heterogeneous population Insufficient power (small sample) Self-monitoring Add-on Ins	2-

						-Neonatal BMI -Cord blood C peptide	-no diff. -no diff.		

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key results	Flaws/Bias	LoE
(226) Niroma-nesh et al. 2012	RCT	GDM non-manageable by dietary measures	160	Metformin	Insulin	• maternal -Glycemic control -Weight gain • neonatal -Birth weight	 -no diff. -Met < Ins Met < Ins	Add-on Ins in 14% Met cases	1+
(227) Barrett et al. 2013	RCT	Confirmed GDM	750	Metformin	Insulin	• maternal -Glycemic control -Weight gain -Triglycerides -CRP • neonatal -Birth weight -Gest. age at delivery -Triglycerides	 -no diff. -Met < Ins -Met > Ins -no diff. -no diff. -Met < Ins -no diff Met increases maternal, but not neonatal triglycerides		1+
(228) Hyer 2012	Comment on # 27								n.a.
(229) Ijäs et al. 2011	RCT	GDM non-manageable by dietary measures	97	Metformin	Insulin	-LGA -Neonatal morbidity	-no diff. -no diff. Higher rate of Cesarean with Met	Bias on maternal BMI Add-on Ins in 30% Met cases	1-
(230) Tertti et al. 2015	Follow-up of RCT	2-year-old children of GDM mothers	146	Metformin	Insulin	Motor and cognitive development	-no diff.	No full text available	?
(231) Wouldes et al. 2016	Follow-up of RCT	2-year-old children of GDM mothers	211	Metformin	Insulin	Mental and psychomotor development	-no treatment-related diff. -significant ethnic differences	Two ethnically different cohorts	1+

9.0 Obstetric management

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
8) Boulvain et al. 2015	RCT	Macrosomic singletons and planned vaginal delivery	818	Labor induction at GW 36-39	Expectant management	-Shoulder dystocia -Composite adverse neonatal outcome	Labor induction decreases dystocia and adverse outcome score	-Detection bias -GDM only in ca. 20% of subjects	1++
9) Sutton et al. 2014	Secondary analysis of RCT	Mild GDM GW 37-41	679	Labor induction	Spontaneous delivery or Expectant management	Caesarean rates for each GW	Labor induction after GW 41, but not before, results in higher rate of Caesarean deliveries	Selection bias Ill-defined expectant management	1+
10) Bas-Lando et al. 2014	Retrospective matched case-control	GDM and normo-glycemia	681	Elective labor induction in macrosomia at GW 38	Elective labor induction, due to PROM at GW>39	-Caesarean delivery	Elective labor induction in GDM is associated with higher Caesarean rates	Small GDM group No data on BMI	2+
11) Niu et al. 2014	Virtual decision model	Diet-controlled GDM	100 000	Labor induction at different GA		-Risk of intrauterine fetal death -Neonatal morbidity	Labor induction at GW 38 yields optimal outcomes	Projection/multiplication of erroneous literature data	2+

10.0 Post-partum sequelae

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
12) Bartakova et al. 2015	Observational retrospective	Post-GDM	305	DM diagnosis WHO criteria		-Post-partum glucose abnormality -Prediction by mid-trimester findings	-16.7% abnormal subject in first year -Sign. correlation with mid-trimester data -IADPSG predicts post-partum diabetes better than WHO	-Retrospective design -Virtual criteria comparison	2+

13) Su et al. 2014	Meta-analysis of published data	Post-GDM	1 086	HbA1c post-partum	75g GTT	-Diagnostic accuracy	HbA1c alone is not sensitive enough to de-tect abnormal glycemic control		1+
14) Kessous et al. 2013	Retrospective follow-up	Post-partum	47 909	GDM	No GDM	Cardiovascular morbidity over 10 years	GDM is independent risk for CV-morbidity	Missing events outside hospital records	2++
15) Tam et al. 2013	Retrospective follow-up	Post-partum	1 031	HbA1c and GTT after 8 and 15 years		Prediction of abnor-mal glycemic and metabolic control	Current GDM cut-offs are not predictive of cardiometabolic risk	Attrition bias No adjustment for confounders	2+
16) Blatt et al. 2010	Retrospective survey	Post-partum (US)	842 293	Testing for GDM and 6 months post-parum		Proportion of tested subjects	-19% of GDM cases are tested for DM post-partum -1.4% post-partum DM rate		2+
17) Chodick et al. 2010	Retrospective survey	National registry (Israel)	185 416	GDM and DM over 5.7 years		Cumulative risk of diabetes diagnosis post-partum	15.7% in GDM 1% in non GDM Insulin-treated GDM confers higher risk	No control for family history, BMI and lifestyle	2+
18) Retnakaran et al. 2009a	Retrospective survey	Regional registry (Canada)	435 696	Positive GCT or GTT	Normal GCT	Cardiovascular morbidity risk over 12 years	GDM or positive GCT confer higher cardio-vascular risk	Misclassification risk	2++
19) Bennett et al. 2009	Meta-analysis of published data	Post-GDM		FBG	GTT	Accuracy in post-partum DM diagno-sis	Single FBG is less sensitive but more convenient than GTT	Pre-diabetic state not considered Reporting bias	1+

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
20) Golden et al. 2009	Meta-analysis of published data	Post-GDM		Ante-partum diagnostic test		Predictive power of post-partum DM2	FBG and GTT 2h can reliably predict DM2	Reporting bias in several studies	1-
21) Bellamy et al. 2009	Meta-analysis of published data	Post-partum	675 455	GTT within 6 weeks after pregnancy		Relative risk of DM2 post-partum	RR of DM2 in women with GDM is 7.43 vs. normoglycemia	Heterogeneous effect size Different GDM diagnostic criteria	1+
22) Retnakaran et al 2009b	Cross-section	Gravidae and post-partum	487	75g GTT 2h in 3rd post-partum week	100g GTT 3h during pregnancy	DM2 diagnostic power of NDDG and ADA criteria	Unlike in GDM, ADA and NDDG have simi-lar predictive capacity in post-partum diabetes	Use of different diagnostic tests before and after parturition	2+
23) Ogonowski et al. 2009	Cross-section	Post-GDM	318	75g GTT 2h in 6th post-partum week	none	-Incidence of IGT -Prediction by GDM risk factors	-13.5% show IGT, 1.3% have DM2 -Early GDM diagnosis, severity of hyperglyce-mia and insulin demand predict DM2	-Overrepresented subgroup with insulin treatment -No real control	2-
24) Retnakaran et al 2009c	Cross-section	Gravidae and post-partum	412	75g GTT 2h in 3rd post-partum week	100g GTT 3h during pregnancy	Prediction of post-partum DM2 by GDM test data	Post-load glucose 1h and 2h values, but not FPG, predict DM2 risk	25% treated with insulin, but data not adjusted	2+
25) Carson et al. 2015	Case-control	Post-GDM	36	In-office test at 1st post-partum visit	Follow-up by referral to ex-ternal test lab	Compliance	In-office test 100%, external referral 53%	HbA1c single test Small sample 75% Hispanics Heterogeneous medical history	2-
26) Kruse et al. 2015	Observational prospective	Primiparae with diet-treated GDM	72	75g GTT 2h in GW 27-30	none	Recurrence rate of GDM in subsequent pregnancy	Recurrence rate 47.2% Association with weight gain between pregnancies	High GDM risk population Small sample	2+
27) Olesen et al. 2014	Observational retrospective	Post-GDM (Denmark)	2 171	DM testing after 3, 12, 24, 48 months		Attendance of follow-up screening	Rapidly decreasing compliance after 3 months post-partum	Potential inaccu-rate record coding	2+

								Sample from socially deprived region	

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
28) Megia et al. 2012	Observational prospective	Post-GDM	364	HbA1c	FPG 75g GTT 2h	Sensitivity/specificity of DM2 diagno-sis	HbA1c has poor sensitivity in diagnosing post-partum DM2	No data on pre-GDM medical history	2+
29) Chaudhry et al. 2015	Observational retrospective	Post-GDM	74	CANRISK questionnaire	FPG and 75g GTT	DM2 detection rate by CANRISK	CANRISK reliably detects dysglycemia in women >40, but not in younger	Small sample No adjustment for confounders Testing 10 years post-partum	2-
30) Bentley-Lewis et al. 2016	Observational retrospective	Post-partum	17 655	Follow-up for hypertension over +4 years		Racial prevalence of hypertension risk	GDM is associated with increased risk of hypertension Dysglycemia in pregnancy predicts hypertension only in Blacks	Insufficient racial diversity No adjustment for confounders	2+
31) Pellonperä et al. 2016	Prospective follow-up	Post-GDM	345	Metformin therapy of GDM	Insulin or Diet only therapy	Glycemic control (GTT, HbA1c) and weight over 1 year post-partum	No sign. consequences of treatment modality on post-partum dysglycemia and weight No GDM medication reduces dysglycemia risk	Attrition bias Co-treatment in metformin group Small sample	2+
32) Zera et al. 2015	Cluster RCT	Post-GDM	847	Screening reminder for physicians	Standard care	Rate of screening compliance	No significant effect of reminder Screening rate ca. 50%	Distinction between physician's and patient's non-compliance not possible	2+
33) Eades et al. 2015	Retrospective follow-up	Post-GDM	164	Diagnosis of DM2		Time to DM2 diagnosis Risk predictors	25% develop DM2 within 8 years post-partum Risk predictors are insulin treatment of GDM, weight gain in pregnancy and FPG at GDM diagnosis	Small sample Retrospective design Missing records Attrition bias	2-

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
34) Kew et al. 2015	Observational prospective	Post-partum (3 years)	320	Urine micro-albumin 75g GTT		Association of current or gestatio-nal dysglycemia with microalbumin-uria	Current glucose intole-rance, but not gesta-tional glycemic status, predicts microalbumin-uria	Small subgroups with different glycemic status	2++
35) Refuerzo et al. 2015	RCT	GDM	79	Metformin	Placebo	Post-partum weight loss over 6 weeks	No significant benefit	Demographic group mismatch Small sample	1-
36) Perez-Ferre et al. 2015	RCT	Post-GDM	260	Mediterranean life style	Conventional life style	Dysglycemia after 3 years of intervention	Significant effects on dysglycemia BW gain and fat intake pattern predict glucose intolerance	No data on physical activity	1-
37) Gunderson et al. 2014	Prospective follow-up	Post-partum (20 years)	898	History of GDM	No history of GDM	Intima/media thickness	History of GDM is associated with major metabolic changes and higher incidence of DM and early signs of atherosclerosis	Small GDM group Major pre-pregnancy demographic mismatches	2+
38) Ehrlich et al. 2014	Prospective cross-section	Post-GDM	72	GTT and IR at 6 weeks and 12 month		Weight loss Glycemic control	Weight loss >2kg is associated with improved glycemic parameters	Small sample Co-intervention Demographic mismatches	2-
39) Shek et al. 2014	RCT	Post-GDM (China)	450	Diet/exercise counseling over 36 mo.	Conventional life style	Incidence of DM2	No significant effect of intervention		1-
40) Retnakaran et al. 2009d	Observational prospective	Pre- and post-partum	259	Abnormal pre-partum GCT	Normal pre-partum GCT	Outcome of GTT at 3 months post-partum	Abnormal GCT in pregnancy, even with normal GTT, predicts post-partum glycemic impairment		2+
41) Akinci et al. 2010	Observational prospective	Post-partum	229	Post-GDM	No GDM	Incidence of meta-bolic syndrome 40 mo. after pregnancy	GDM history increases liability to metabolic syndrome post-partum	Inadequately low BMI of controls No data on MS incidence in controls	2-

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
42) Aroda et al. 2015	Follow-up of RCT	10 years post-partum	1 766	History of GDM + metformin, placebo or lifestyle	No history of GDM + metformin, placebo or lifestyle	Prevalence of DM after 10 years of intervention	-History of GDM with-out treatment increases DM risk -Metformin and life-style reduce progres-sion to DM in cases with GDM history -Lifestyle, but not met-formin attenuates pro-gression to DM in cases without GDM history		1++

11.0 Breastfeeding

Study #	Type/Design	Population	Sample size	Intervention	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
43) Gunderson et al. 2015	Observational prospective	Post-GDM	959	Lactation (duration & intensity)	none	Incidence of DM as disclosed by annual GTT over 2 years	Graded inverse asso-ciation of lactation duration/intensity and DM incidence	Lactation assess-ment by ques-tionnaire No cases without GDM history	2++
44) Morrison et al. 2015	Cross-section survey	Post-GDM (Australia)	729	Breastfeeding	none	Reasons for cessa-tion <3 months	-28.7% introduce com-plementary feeding by 3 months Insufficient milk supply (45%) and social reasons are lea-ding factors	Online inquiry Comparisons to non-GDM cases from population records	2+
45) Morton et al. 2014	Meta-analysis of published data (excerpt)	Post-GDM		Breastfeeding		Incidence of DM	No convincing evidence	Only 2 major studies with controversial results	n.a.

46) Shearrer et al. 2015	Observational survey	2-4 y-old children of GDM mothers	2 295	Breastfeeding	No breast-feeding	Incidence of obesity	-Breastfeeding over >12 months decreases obesity prevalence in GDM offspring by 72%	-Data by phone interview -Very restricted ethnic and social group	2-
47) Gunderson et al. 2014	Observational prospective	Post-GDM	1 007	Lactation intensity		DM-indicative biomarkers over 2 years	Higher lactation intensity is associated with favorable biomarker profiles, except for adiponectin	Lactation assessment by questionnaire No cases without GDM history	2++
48) Kachoria et al. 2014	Observational retrospective	Post-partum records over 5 y (US)	803 222			Breastfeeding initiation rate after delivery Racial variations	-Increasing trends with time in GDM- and non-GDM mothers -Non-breastfeeding Caucasians are likely to be obese or diabetic -Breastfeeding in Blacks is lower, regardless of health status	Full text non-accessible	2+
Study #	**Type/Design**	**Population**	**Sample size**	**Intervention/ Variable**	**Comparator**	**Primary endpoint**	**Key result**	**Flaws/Bias**	**LoE**
49) Cordero et al. 2013	Observational prospective	Post-GDM	303	Preferred infant-feeding practice		Reasons for breast-feeding cessation	-Breastfeeding initiated by 54% -Cessation depends on African ethnicity, low education, obesity, smoking and NICU admission	Full text non-accessible	2+
50) Matias et al. 2014	Observational retrospective	Post-GDM	883	Delayed onset of lactation		Associated risk factors	Occurs in 33% -pre-pregnancy obesity -older age -GDM insulin therapy	Recall bias (late data collection)	2+
51) Maayan-Metzger et al. 2014	Case-control	Post-GDM	79	Breastfeeding duration in delivery room		Neonatal hypoglycemia over 8 hours	Longer delivery room breastfeeding does not reduce hypoglycemia	Full text non-accessible Small sample	2-

52) Finkelstein et al. 2013	Observational retrospective	Post-partum	24 755	GDM with different treat-ment	No GDM	Breastfeeding rate	No GDM > untreated GDM > non-insulin-treated GDM > insulin-treated GDM	Disproportionally small GDM treat-ment groups	2++
53) Chouinard et al. 2013	Observational prospective	Post-GDM	144	Lactation duration	No lactation	Glycemic control and HOMA-IS in GTT after 4 years	Longer lactation (>10 months) improves insulin sensitivity and glycemic control	Questionnaire data collection Demographic confounders Small control group	2+
54) Ziegler et al. 2012	Observational prospective	Post-GDM	304	Lactation duration		Post-partum DM diagnosis by GTT over 19 years	-Breastfeeding for +3 months reduces DM risk -Insulin-treated GDM has higher DM risk independently of body mass	Insufficient data on post-partum lifestyle	2++
55) Gunderson et al. 2012	Observational prospective	Post-GDM Lactating	835	Breastfeeding during GTT	No breastfee-ding during GTT	Glycemic control by 2h GTT at 6-9 week post-partum	Modest decrease (5%) of glucose and insulin responses in GTT	Strong demogra-phic mismatches	2-

Study #	Type/Design	Population	Sample size	Intervention/ Variable	Comparator	Primary endpoint	Key result	Flaws/Bias	LoE
56) O'Reilly et al. 2012	Observational prospective	Post-partum	520	GDM history ± Lactation	No GDM history ± Lactation	Dysgylcemia signs in 75g GTT	-Non-European ethnicity, history of DM and gestational insulin use predict persistent dysglycemia -Breastfeeding significantly reduces dysglycemia occurrence	Full text non-accessible	2+
57) Gunderson et al. 2010	Observational prospective	Post-partum	704	Lactation duration		Incidence of metabolic syndrome over 20 years	Longer lactation prevents metabolic syndrome regardless of GDM history	No data on lactation intensity Self-reported GDM history	2++
58) Soltani et al. 2009	Observational retrospective	Post-partum Diabetes (all types)	94			Breastfeeding rates over 6 months post-partum	GDM >DM1 and DM2 Diabetes type predicts breastfeeding behavior	Full text non-accessible Small sample	2-
59) Chertok et al. 2009	Case-control	Newborns to GDM mothers	84	Breastfeeding in delivery room	Breastfeeding outside delivery room	Serum glucose levels	Breastfeeding in delivery room significantly reduces hypoglycemia	Variable time of blood sampling Small sample	2+