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Review Article

Revisiting the link between abnormal uric acid levels and gestational diabetes mellitus: A systematic review

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ABSTRACT

Rise in uric acid (UA) levels is linked with inferior pregnancy outcomes; nevertheless, there is absence of proof at the moment to propose that high uric acid levels are related to a high likelihood of gestational diabetes mellitus (GDM). As a result, to discuss the link of rise in UA during pregnancy with the chance of having GDM.

The articles have been chosen from the databases PubMed, Embase and Scopus. We discussed all applicable publications that explored the interrelation between serum UA and GDM, accompanying the formerly recorded articles. Other articles independent of this field are refrained from. This systematic review exhibited a bond between GDM and serum UA levels.

Further research can positively enable the support of prompt identification. Deleterious effects on the mother-foetus duo could be kept away by managing gestational diabetes during early stage.

1. Introduction

Regardless of notable progress in science, doctors keep treating patients with adverse pregnancy outcomes (APO) such as gestational diabetes mellitus (GDM), antenatal hypertension, pre-eclampsia & perinatal development malformations. GDM is the most alarming of these, while it has an effect on 7–25% of pregnancies which are clinically confirmed globally.[1–3] GDM is defined by the American Diabetes Association as any level of glucose intolerance experienced during pregnancy in a pregnant women who have never been diagnosed as type 1 or type 2 diabetics before.[4] In accord with latest study, few of the features which give to the beginning of GDM comprise being overweight, consuming poorly, malnutrition, advanced maternal age, and a family record of either diabetes or resistance to insulin.[5] Resistance to Insulin resistance and decreased insulin production are considered to have a major role in GDM pathophysiology, although the basic reasons of the condition are obscure.[6] Researches have shown that women with GDM have a tremendously high chance of having type 2 diabetes, with up to 50% women developing type 2 diabetes within 10 years of delivering the child. Additionally, child born with history of GDM, have high chances of having glucose intolerance, diabetes and obesity in future.[7]

As of right now, there is no widely accepted method for preventing or treating GDM. The only treatments available are insulin therapy and lifestyle modifications, both of which have limited effectiveness because insulin resistance is a prevalent manifestation in GDM patients.[8] Regularly consumed medications, like metformin and glyburide, have

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revealed

agreeable results, there have been concerns about the long-established influence of these drugs on pregnant women and their children.[9,10] An untimely recognition of GDM is mandatory to keep down unfavourable after-effect for mother-newborn duo.

UA is the end-product of purine metabolism, which decreases by 25–35% in the early stages of pregnancy before increasing towards normal values near term in a healthy pregnancy.[11] Multiple studies have demonstrated that high amounts of uric acid are harmful to metabolic health because they impede insulin signalling, which leads to insulin resistance.[12] In light of this, hyperuricemia has been suggested as a part of the metabolic syndrome linked to insulin resistance.[13] Additionally, Khosla et al.[14] demonstrated that elevated uric acid levels may cause endothelial dysfunction, which lowers the generation of nitric oxide.Animal research has demonstrated that nitric oxide is required for the uptake of glucose, and that a lack of it can result in hyperglycemia.[15,16] Moreover, there may be a link between UA levels and resistance to insulin in expectant women with prenatal hypertension.[17] Compared to women without the illness, women with gestational diabetes have greater amounts of uric acid throughout the early phases of pregnancy.[18] Despite a great deal of study being done in this area, the occurrence of GDM hasn't been invariably linked to UA levels throughout pregnancy. The possible impact of elevated UA levels on the potential of GDM is a topic of debate. Thus, so as to successfully handle this medical condition among this high-risk population, an in-depth knowledge of this problem is required. To verify whether elevated levels of UA throughout pregnancy can raise the chance of subsequently developing GDM, independent of already recognised risk factors, we therefore set out to conduct a systematic review.

2. Methodology

2.1. Search strategy and study selection

In order to conduct a systematic review, we followed PRISMA guidelines.[19] Numerous pertinent databases, such as Scopus, Embase, and PubMed. A wide range of research papers and studies that shed light on the connection between maternal uric acid levels and GDM may be found in these databases. We tried to reduce any potential bias and make sure our review was based on a variety of trustworthy sources by using multiple databases.

2.2. Inclusion and exclusion criteria

Strict inclusion and exclusion criteria were set in order to guarantee the caliber and applicability of the research that were part of our review. Regardless of the study design or the date of publication, we included research that looked at the relationship between maternal uric acid levels and GDM. Nevertheless, research with a significant risk of bias or insufficient data was omitted. We sought to offer a thorough and trustworthy analysis of the available data by following these standards.

2.3. Data extraction and analysis

Data extraction was performed independently by two reviewers to minimize errors and ensure accuracy. We collected information on study characteristics, including sample size, study design, and measurement techniques for maternal UA levels. Furthermore, we collected data related to a relationship between UA levels and GDM, including any reported odds ratios or risk estimates. Finally, we performed a qualitative analysis of the findings to identify common themes and trends across the studies included in our review.

3. Results

120 articles were chosen using the structured literature search. 30 duplicate papers were removed, while 38 articles were left out due totitles and abstracts, 9 studies were found using pertinent references, 24 articles were eliminated on the grounds of inclusion criteria, and nineteen articles that satisfied both exclusion and inclusion criteria were chosen. 9 observational studies, 8 cohort studies, 1 descriptive case series study, and 1 case-control study were incorporated in the literature review. The search was restricted to articles published in English. Figure 1, and Table 1 provide a comprehensive overview of the search plan and findings.

Li, X., Niu, Z., Bai, L. et al. (2024)[20] conducted a cross-sectional observational study, included total 6000 pregnant women. In the normal glucose tolerance (NGT) group with 4256 patients and GDM group having 1744 patients were enrolled utilizing the criteria for diagnosis of GDM decided by International Association of Diabetes and Pregnancy Study Groups (IADPSG). Four subgroups were established applying the first-trimester serum UA level quartile and the variations in every parameter among the groups were studied. Detailed scrutiny of the links within UA levels and chance of GDM was completed utilizing logistic regression. In the UA quartile, the incidence of GDM rose from low towards high. Significant variations were also noted in the plasma glucose levels during fasting, one hour after glucose, and two hours after glucose in every group ($P<0.05$), and these differences rose as the UA level decreased. The UA level found to be a separate risk indicator for GDM. A GDM threshold of 226.55 μmol/L was found by the first-trimester UA level.First-trimester UA values were significantly higher in patients with GDM, which constituted a separate risk factor for the disease.

Reddy MA et al. (2022)[21] in their prospective observational study found of the 56 pregnant women, 17 (30.3%) developed GDM. Of these, 5 women (29.4%) with

GDM had normal uric acid levels, whereas the other 12 (70.6%) with GDM had higher levels.

Zhao Y et al[22] in 2022 managed to conduct a cohort study having 85,609 pregnant women. Of the 85,609 pregnant women, 11,960 developed GDM, or 14% among the total. Serum UA levels and the likelihood of GDM were found to have non-linear associations, with relationships changing with the age of gestation. There was only a statistically significant association between high serum UA levels and an increased risk of GDM between weeks 13th and 14th of pregnancy. The odds ratios for GDM were 1.11 [95% confidence interval (CI), 1.03–1.20] for the second quintile, 1.27 (95%CI, 1.17–1.37) for the next, 1.37 (95%CI, 1.27–1.48) for the next, and 1.70 (95%CI, 1.58–1.84) for the final quintile of serum UA in comparison with the first quintile, according to analysis by UA quintiles at 13–18 weeks gestation. Serum UA levels along with GDM had a greater correlation in pregnant women 35 years of age and older.

Chaoyan Yue et al. (2023)[23] conducted an observational cohort study and found a significant correlation was shown between the likelihood of GDM and increased uric acid levels prior to Twenty-four weeks of pregnancy, as 3204 (13.44%) of the 23,843 pregnant women got diagnosed with GDM between 24 and 28 weeks of pregnancy. Comparing UA levels <240 μmol/L to uric acid levels between 240 and 300 μmol/L, With UA levels 300 μmol/L, the relative risk (RR) for the disease was 1.82 (95% CI 1.55-2.15); the RR for GDM was 1.43 (95% CI 1.29-1.56). Preterm birth, GDM, and GDM A2 (medication-requiring GDM) showed similar relationships with uric acid, in conjunction with pre-eclampsia in secondary outcomes.

Ganta SJ et al. (2019)[24] in their prospective study found 88 (28%) of the 312 pregnant women had GDM. Of these, it showed that 74 women (84%) with GDM had higher UA levels than the 14 women (15.9%) with GDM.

C R, Samal S et al. (2014)[25] supervised a prospective study and Despite a significant correlation with serum UA at 24 to 28 weeks of gestation, tracked serum UA at fewer than 15 weeks of gestation is a more reliable indicator of gestational glucose intolerance and GDM. (Pearson's correlation = 0.735).

In a prospective observational cohort study, Sharma N et al. (2023)[26] studied total 336 pregnant women.Most were primigravida (65.18%), in the age bracket of 21–25 years (51.49%), and had a BMI of less than 25 kg/m2 (86.01%). Forty patients, or 11.9%, had high-risk factors. Of the individuals, 54 (16.07%) had serum uric acid levels greater than 3.5 mg/dl. There were 27 instances (7.71%) of GDM, and 24 of those individuals had increased serum uric acid. The risks of GDM occurring were considerably higher in those who were older, with an odds ratio of 8.125 (P=0.0004). Significantly greater chances of 11.722 and 74.4, respectively, for the incidence of GDM were associated with higher-risk variables and raisedUA levels (P<0.0001). The sensitivity of serum UA levels with an acceptable level of >3.5 was 88.9% and specificity of 90.3% for GDM prediction, according to the ROC curve.

Lavee Mehrotra et al. (2021)[27] conducted a prospective observational cohort study with 78 first trimester pregnant women. Among the 50, 28 patients had high serum UA (>4.2) in addition normal serum UA (<4.2). 68 patients had normal GTT findings, compared to 10 who had abnormal findings, of 28 patients, 4 had elevated serum UA and 6 of 50 individuals whose serum UA levels were normal also had positive GTT findings.

In a prospective observational cohort study, Laughon SK et al (2009).[18] studied SUA levels in 1570 pregnant women at 8.9 ± 2.5 weeks gestational period on average. UA levels in the first trimester of pregnancy fell within the highest quartile (>3.57-8.30 mg/dl) in the majority of GDM women (46.6%). After accounting both age as well as body mass index (BMI), women with UA levels in the top quartile had a 3.25-fold increased risk (95%CI: 1.35, 7.83) of having GDM. Risk increased as uric acid quartiles rose, suggesting that concentration was a determining factor in this effect (p=0.003).

Şahin Aker S et al. (2016)[28] examined 626 pregnant women in a retrospective research. Comparatively, 202 healthy pregnant women were compared to 66 women in the GDM group and 358 women in the Impaired Glucose Tolerance (IGT) group. In the GDM and IGT groups, the mean serum UA levels were 5.95 mg/dL (±0.97 mg/dL) and 4.76 mg/dL (±1.51 mg/dL), respectively. These results showed a substantial increase (p<0.001) above the 3.76 mg/dL (±1.07 mg/dL) in the control group. With respect to the diagnosis of GDM, the area under the curve for UA levels was 0.92 (95% confidence interval 0.88-0.95). The UA values proved to be 100% sensitive and 60% specific for forecasting the onset of GDM at diagnostic thresholds of 3.95 mg/dL.

Rehman A et al. (2021)[29] conducted a case-control study. Serum UA levels in the patients were 3.73±0.43 mg/dl (P=0.0001), whereas the levels were 3.19±0.49 mg/dl in the control group. The logistic regression analysis model yielded a ROC curve with a large area under the curve (AUC) of 0.92 [95% CI 0.87-0.97) and a diagnostic threshold for uric acid of 3.91 mg/dl. The specificity and sensitivity were 69.7% and 96.4%, respectively, at this uric acid threshold (P=0.0001).

A prospective observational study was conducted by El-Gharib MN et al. (2013).[30] The study's findings showed a connection between GDM and first trimester maternal blood uric acid content obesity. About 44.8% (47/105) of the diabetes women were at the fourth quartile, compared to 41.4% (60/145) of the non-diabetic women.

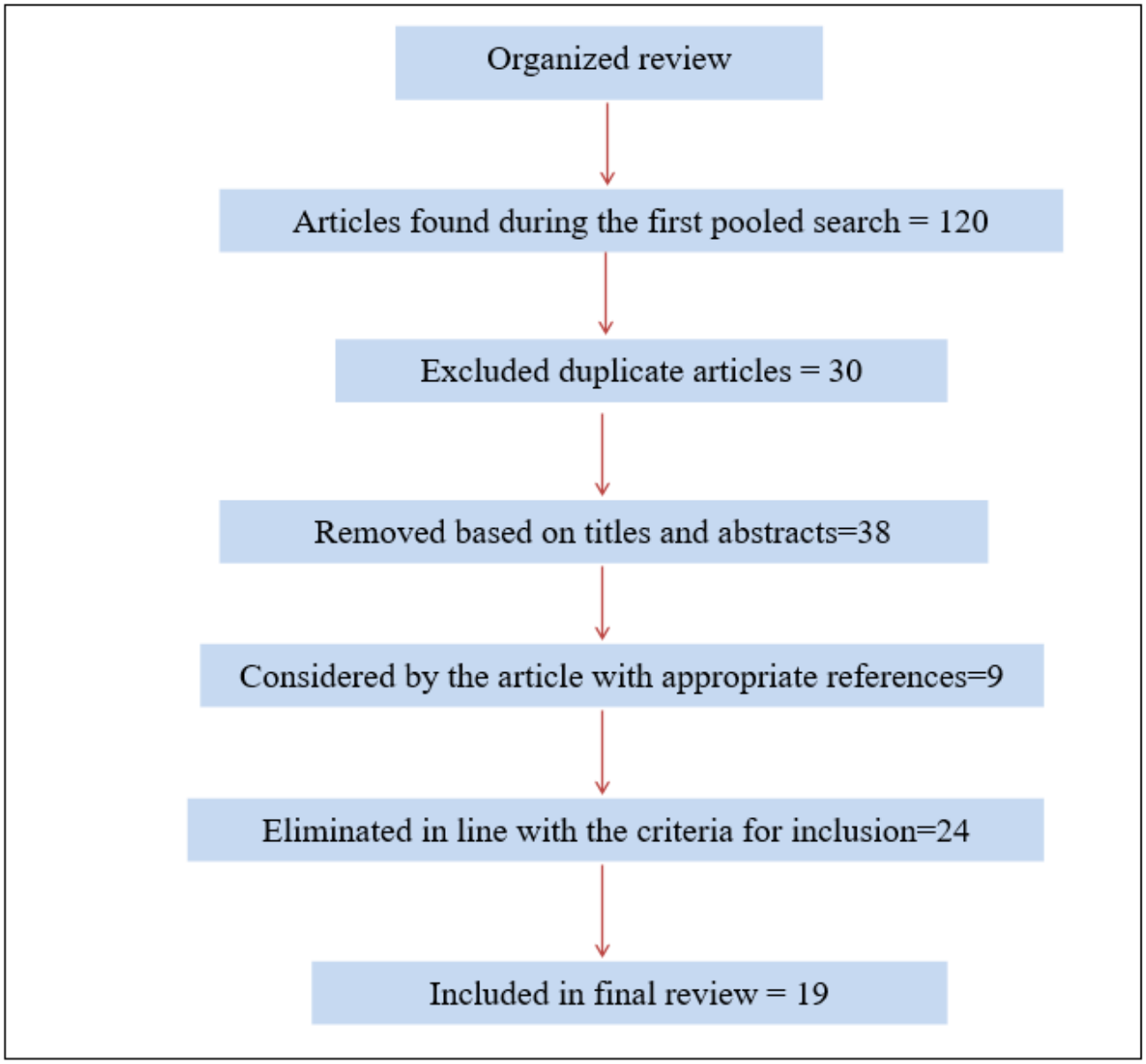

Figure 1: Retrieval of data

Table 1: Overview of the studies included

S. No.	Study Design	Country	Objective of study	Outcomes	Ref.
1.	A cross-sectional observational study	China	To investigate into the link between serum UA levels during first trimester and GDM.	A distinct risk factor for the condition was found in GDM patients, who had considerably higher first-trimester UA levels.	20
2.	A prospective Observational study	India	To investigate the potential that a higher risk of developing GDM may be associated with elevated serum UA levels during the first trimester of pregnancy.	The onset of GDM is strongly associated with elevated levels of serum UA in the first trimester.	21
3.	A cohort study	China	To investigate the relationships between the chance of developing GDM after pregnancy and serum UA levels in the first and second trimesters.	Among the 85,609 Chinese pregnant women in the current study, researchers discovered a significant link between elevated blood UA levels at 13–18 weeks' gestation and a higher risk of GDM.	22
4.	An observational cohort study	China	To provide clinical epidemiological evidence supporting uric acid's role in the etiology of GDM and to clarify the association between changes in blood UA levels before to 24 weeks of gestation and the likelihood of GDM and related unfavourable pregnancy outcomes.	The ideal time for getting UA levels done is before 18 weeks of pregnancy because high levels UA until 24 weeks are associated with GDM subsequently on.	23
5.	A prospective observational study	India	To ascertain whether raised UA levels during the early trimester of pregnancy have been linked with GDM.	The results of this study indicate that if a woman's UA level is below 3.5 mg/dl during the early stages of pregnancy, it is possible to identify with a good degree of sensitivity and specificity the individuals who are most likely to develop gestational diabetes mellitus later in pregnancy.	24
6.	A prospective observational study	India	To determine whether increased first trimester UA is linked to developing of GDM.	UA levels at below 15 weeks of pregnancy are significantly connected with the likelihood of developing GDM, as opposed to values at 24 to 28 weeks.	25
7.	A prospective observational cohort study	India	To assess the importance of serum uric acid during the early weeks of gestation in order to forecast the onset of GDM.	The study's main finding was the link between blood UA levels and the occurrence of GDM. The associations between age, BMI, and high-risk factors and the start of GDM were among its secondary findings.	26
8.	A prospective observational cohort study	India	To assess the potential of serum UA as a marker for GDM	Found evidence for a potential connection between higher blood UA levels in the early stages of pregnancy and a higher risk of developing GDM.	27
9.	A prospective observational cohort study	Pittsburgh, PA	To establish that First-trimester UA levels that are increased are associated with the development of GDM.	Regardless of BMI, first-trimester hyperuricemia is linked to an increased risk of developing GDM.	18

Continued on next page

Table 1 continued

10.	A retrospective observational study	Turkey	To investigate the connection between the onset of GDM and the first trimester serum UA levels in low-risk pregnant women.	There is a chance of developing impaired glucose tolerance and eventually GDM if there is an increase in serum UA in the first trimester.	[28]
11.	A case-control study	Pakistan	To determine the first trimester's serum UA levels prognostic value for the onset of GDM in pregnant women.	Serum UA levels during the first trimester may be predictive of GDM development later on.	[29]
12.	A prospective observational study	Egypt	Aimed in investigating any connections between UA levels in the first trimester and the early onset of GDM.	Early in pregnancy, a mother's serum UA level below the 4 mg/dl standard has been linked to an increased risk of GDM.	[30]
13.	A retrospective cohort study	China	To analyze the link between the risk of GDM and serum UA levels in the early pregnancy	Higher levels of UA were found to be independently associated with a higher likelihood of GDM during the 16–18 week of pregnancy.	[31]
14.	A descriptive case series study	Pakistan	To find out how common GDM is in first-trimester pregnant women with raised serum UA levels.	The average prevalence of GDM in populations with high UA levels varies from 50 to 51%.	[32]
15.	A retrospective cohort study	China	To assess if an elevated Serum UA during the early pregnancy is linked to greater likelihood of GDM thereafter	In Chinese women with acceptable blood pressure, more substantial UA levels in the early stages of pregnancy were linked to an elevated probability of GDM.	[33]
16.	A prospective cohort study	India	To determine if first-trimester blood uric acid levels might predict gestational diabetes mellitus.	This study emphasizes the clinical importance of uric acid in assessing GDM risk and suggests opportunities for better screening procedures.	[34]
17.	A prospective double-centre study	China	To evaluate the alterations of serum UA in early stages of pregnancy, and to investigate potential relationships between GDM vulnerability and serum UA.	Early in pregnancy, women with GDM had significantly greater serum UA levels compared women having NGT.	[35]
18.	A prospective observational clinical study	Egypt	To investigate the connection between elevated UA levels in the first trimester and the possibility of GDM.	An elevated serum UA level of 4 mg/dl in the first trimester has been associated with the progression to GDM.	[36]
19.	A retrospective cohort study	China	To determine the GDM risk factors and develop an early risk prediction model by comparing first trimester indicators between pregnant women with GDM and those without GDM	Independent risk factors for GDM include age, prior to pregnancy BMI, HbA1C, serum UA, TG, & HDL-C.	[37]

According to Li et al. (2020)'s[31] multivariate adjusted logistic regression analysis, UA levels in the highest quartile were associated with a 55.7% higher risk of GDM than those in the lowest quartile (odds ratio [OR]: 1.557, 95% confidence interval [CI]: 1.055-2.298; p = 0.026). There was a commensurate increase in the risk of GDM of 67.6% (95% CI: 1.090-2.421), 112.4% (95% CI: 1.446-3.119), and 94.5% (95% CI: 1.314-2.880) for GDM in relation to USG levels in the first, third, and fourth quartiles (p trend = 0.001). A clear association between UA levels and GDM incidence was not observed. The highest and lowest composite biomarker score's quartiles were compared and the adjusted odds ratio (95% CI) for GDM turned out to be 1.909 (95% CI: 1.332-2.736). Analyses stratified by age showed comparable outcomes for women under the age of 35, whereas they were different for those over 35.

Amna Ismail et al (2019)[32] conducted a descriptive case series study. Frequency and percentage were recorded in two groups (one with gestational diabetes mellitus (GDM) and the other without it). 81 patients (57.9%) had positive GDM, while 59 patients (42.1%) had negative GDM or none at all. About 50 to 51 percent of women with high serum UA levels have GDM. The frequency of GDM in the population with high blood uric levels was determined by researchers using the one sample t test, also known as a one-sided test.

In 2023, Pang, TT et al.[33] carried out a retrospective cohort study. The mean mother UA level was 0.22 ± 0.05 mmol/L, and 2,896 patients (15.9%) of had hyperuricemia. UA was connected to a number of unfavourable outcomes even after controlling for a number of variables. The odds ratios (95%CI) for GDM were 1.250 (1.136, 1.277) per standard deviation rise in serum UA levels.

Devireddy Hemaswapnika et al. (2023)[34] found that first-trimester serum UA levels were significantly associated with the development of GDM in a prospective cohort analysis. Participants with uric acid levels between 4.0 and 4.5 mg/dL and those with values below 4.0 mg/dL had an odds ratio of 1.82 (95% CI: 1.51-2.21), indicating an increased likelihood of GDM. Levels of uric acid exceeding 4.5 mg/dL demonstrated 85% sensitivity and 68% specificity. Predictive accuracy may be improved by combining uric acid with conventional risk factors as mother age and body mass index.

Duo Y et al. (2023)[35] conducted a prospective double-centre study with 873 pregnant women. In this group, GDM was present in 20.27% of cases (177/873). Compared to women who were not pregnant, there was a significant decrease in serum creatinine and UA levels early in pregnancy. During the initial stages of pregnancy, women with GDM had a substantially higher serum UA concentration than women with normal glucose tolerance (NGT) [217.0(192.9, 272.0) μmol/l vs. 201.9(176.0, 232.0) μmol/l, p < 0.001]. Elevated serum UA was still a distinct risk factor for GDM even once uncertainties were taken into consideration. Serum UA levels above 240 μmol/l were associated with a higher risk of GDM (adjusted OR 1.964, 95% CI 1.296-2.977, p < 0.001). Serum UA and GDM were significantly correlated in pregnant women over 35 with a pre-pregnancy BMI of at least 24 kg/m2.

A prospective observational clinical study in Egypt by Ali El- Shabrawy Ali et al. (2019)[36] included 78 first-trimester pregnant women as participants. Sixteen (61.5%) of the women with GDM in group I had high fasting blood sugar (FBS) in the second trimester, seven (26.7%) in both the second and third trimesters, and three (11.5%) in the normal range. Nine (34.6%) had raised FBS in the second trimester, one (3.8%) had normal FBS, and sixteen (61.5%) had high FBS in both the second and third trimesters. Group III had 1 (3.8%) with normal FBS, 5 (19.2%) with elevated FBS in the second trimester, and 20 (76.9%) with elevated FBS in the second and third trimesters. P=0.007 showed that the groups' differences were statistically significant.

Niu Z et al. (2023)[37] included 6000 pregnant women in a retrospective cohort study. Age, prior to pregnancy BMI, Serum UA, triglyceride (TG), glycosylated haemoglobin (HbA1c), and high-density lipoprotein cholesterol (HDL-C) in the initial trimester of pregnancy were found to be distinct risk factors for GDM (P < 0.05).

4. Discussion

A major factor in GDM is insulin resistance. Numerous investigations have revealed that the ingenious molecule uric acid plays a role in insulin resistance.[38,39] In addition to interfering with insulin function; uric acid also has a propensity to cause inflammation and oxidative stress. The delicate equilibrium in the body can be severely disrupted by these two troublemakers, which can result in the development of gestational diabetes.[40,41] Uric acid also has an impact on those priceless pancreatic beta cells that make insulin. These cells may be harmed by uric acid, which could reduce their ability to produce enough insulin to regulate blood sugar levels.[42–44]

Increased renal excretion and the uricosuric impact of elevated oestrogen levels during pregnancy lead to decreased serum UA levels.[45] Pregnancy causes a 25% drop in blood concentration from 6 to 12 mL/min to 12 to 20 mL/min due to the faster clearance of UA. The changes in renal processing have been associated with variations in blood uric acid levels during pregnancy.[46] Raised serum UA levels are linked with a number of unfavourable pregnancy outcomes. It may result in cardiovascular illness, renal dysfunction, and oxidative stress—conditions that are frequently seen in severe preeclampsia.[47] A number of theories have been put forth to explain how hyperuricemia affects the course of pregnancy. Brien et al. showed how the placental system transport of amino acids could be discretionary, resulting in hyperuricemia and

intrauterine growth restriction. It has also been noted that a malfunctioning placenta may result from hyperuricemia. The results of this study demonstrated that perinatal discomfort is more common in children born to mothers who have hyperuricemia.[48] According to a study by Sautin et al., Uric acid causes endothelial cell dysfunction and, as a result, reduces the amount of nitric oxide that the cells produce. Animal skeletal muscle and adipose tissue absorb glucose by a mechanism fuelled by nitric oxide, which is produced by insulin. Thus, a decrease in nitric oxide levels leads to a decrease in glucose absorption and the subsequent emergence of insulin resistance.[49]

In physiological conditions, an acceleration of insulin resistance is expected throughout the middle of pregnancy; when the baby is born, this resistance eventually returns to normal. The numerous metabolic alterations that take place in the middle of pregnancy and raise insulin resistance are identified using a homeostatic model for insulin resistance. Furthermore, hyperuricemia, maternal obesity, and the presence of diabetogenic hormones all increase the risk of developing insulin resistance during pregnancy.[50] Weisz et al.'s study found a strong correlation between elevated insulin resistance, hyperuricemia, and pregnancy-related gestational hypertension.[51]

Previous research demonstrating the link between the two illnesses has led to the identification of hyperuricemia as a major risk factor for GDM during the first trimester of pregnancy.[22] Another study demonstrated a weak correlation between hyperuricemia and the risk of GDM throughout the second trimester and the postpartum period.[52]

If neglected, glucose intolerance which is initially identified during pregnancy, can have negative effects on both the mother and the foetus. GDM usually appears in the latter half of the second or third trimester of pregnancy and lasts until delivery. After six weeks, a high blood glucose level following birth usually recovers to normal. In 2017, 16.2% of the incidence of a high blood sugar during pregnancy had an adverse impact on live births overall with 86.4% of cases having GDM.[53]

It is already known that hyperuricemia independently predisposes people to diabetes mellitus, cardiovascular morbidityand metabolic syndrome. Non-pregnant females experiencing hyperuricemia without symptoms experience increased insulin resistance due to release of inflammatory cytokines and oxidative stress, this eventually causes blood glucose levels to rise. Similarly, it raises the incidence of GDM and is a major risk factor for insulin resistance during pregnancy. Elevated UA is linked to pregnancy-related insulin resistance. Therefore, the main emphasis of this review was on the role that hyperuricemia plays in pregnant women's development of GDM.[54]

Another study found a substantial linear correlation between the progression to GDM later in pregnancy and the serum UA levels during first 20 weeks of pregnancy.[55] Furthermore, around 50–51% of total pregnant women with hyperuricemia also had GDM, according to Ismail et al.[32]

5. Conclusion

The development and mechanism of insulin resistance resulting from hyperuricemia are identical in non-pregnant and pregnant females. An increased incidence of insulin resistance and GDM is associated with hyperuricemia. This is typically caused by the activation of oxidative changes in adipose tissues through the production of UA by adipocytes, the suppression of nitric oxide release by endothelial cells, and the facilitating involvement of inflammatory cytokines.

Additional research is required to firmly demonstrate a link between hyperuricemia and GDM. In addition, we must determine the pathophysiologic mechanisms that underlie this connection and the part that various predisposing variables play in the progression to GDM when conjunction with increased UA levels. It may be possible to expedite early diagnosis and screening with more research. By treating gestational diabetes early on, both the mother and the foetus can be spared the possibility of adverse effects.

6. Sources of Funding

None.

7. Conflict of Interest

None.

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