

Cross-Sectional Study of the Influence of Gestational Hyperglycemia Associated With Urinary Incontinence on Quality Of Life

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Abstract

During pregnancy, the prevalence of Urinary Incontinence (UI) is higher adversely impacting quality of life. Both Gestational Diabetes (GDM) and mild hyperglycemia have been associated with increased risk of UI. However, UI influence on quality of life is still poorly understood. The objective of this study was to assess the impact of UI on the quality of life of women with GDM. Method: Cross-sectional study including pregnant women allocated into 2 groups: Normoglycemic (NG) or Hyperglycemic/GDM (HG). All women classified as incontinent were asked to respond to the King's Health Questionnaire (KHQ). Results: Of the 102 pregnant women enrolled, 69 were NG (67.6%) and 33 were HG (32.4%). UI prevalence was 55.9%. HG scores were lower for all KHQ domains with significant differences between groups regarding the scores for KHQ domains general health perception, UI impact, personal relationships emotions, and sleep/energy ($p < 0.05$). Conclusions: UI impact was higher on pregnant women with hyperglycemia and GDM.

Keywords: Gestational diabetes mellitus; Urinary incontinence; Quality of life

Introduction

Urinary Incontinence (UI) is defined by the International Continence Society (ICS) as the involuntary loss of urine that represents a hygienic or social problem to the individual [1]. Despite not being life-threatening, UI affects women on their daily living activities, social interactions, interpersonal and sexual relationships, careers, and psychological wellbeing thereby adversely impacting their quality of life [2-10]. The etiology of UI is multifactorial, but hyperglycemic disorders and pregnancy are recognized as important risk factors. UI prevalence and severity are significantly higher during pregnancy and in women with diabetes mellitus or a history of gestational diabetes mellitus (GDM) [11-16].

GDM is any degree of glucose intolerance with onset or first recognition during pregnancy [17,18], a period characterized as a diabetogenic state [19] marked by progressive metabolic and hormonal changes [20]. Just like UI, GDM may also negatively impact quality of life. In a survey conducted in 10 Italian centers specialized in the care of pregnant women with diabetes, Lapolla et al. observed that the diagnosis of GDM caused anxiety; one-third of women feared their child could contract diabetes at delivery and/or have congenital malformations [21].

Barbosa et al. [13], in a study of the inter-relationships among GDM, pelvic floor dysfunction and UI, reported that UI prevalence two years after childbirth was higher in women with a history of GDM. Kim et al. [14] found that 49% of 228 women with a history of GDM reported weekly or more frequent incontinence during pregnancy. Chuang et al. [22], investigating the occurrence of all types of UI and type-specific risk factors in the third trimester of gestation and at four time-points over 2 years after childbirth in 6653 women consecutively recruited, concluded that GDM was an independent risk factor for postpartum UI, and that quality of life was generally poorer among women with GDM.

Quality of life is an individual's perception of their position in life in the context of the culture and value systems in which they live

and in relation to their goals, expectations, standards and concerns [23]. Studies have demonstrated clinical associations between UI and hyperglycemia during pregnancy [13,14]. However, the influence of this condition on quality of life is still poorly understood. Thus, the objective of this study was to assess the impact of UI on the quality of life of women with GDM.

Methods

This cross-sectional study included all pregnant women at 24-28 weeks of gestation receiving prenatal care at the Pregnancy and Diabetes Center of Botucatu Medical School, São Paulo State University/UNESP between December 2009 and December 2010. The study was approved by the local Research Ethics Committee (#426-08), and written informed consent was obtained from all subjects.

GDM was diagnosed using 100-g GTT combined with glycemic profile (GP) testing, which allows classifying pregnant women as being non-diabetic (normal GTT and GP), or having mild gestational hyperglycemia (normal GTT and abnormal GP), or gestational diabetes (abnormal GTT and normal GP), or overt diabetes (abnormal GTT and GP). Thus, based on 100-g GTT and GP results, study participants were allocated into one of the following groups: normoglycemic- NG (normal 100-g GTT+ normal GP), and hyperglycemic-HG (normal 100-g GTT+ abnormal GP or abnormal 100-g GTT+ abnormal GP)[24].

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Pregnant women with a history of previous GDM, pre-gestational type 1 or type 2 diabetes mellitus, systemic arterial hypertension or gestational hypertensive disorders, pre-gestational UI, neuromuscular diseases, cognitive disorders, previous or current twin pregnancy, vaginal inflammations and infections, age under 18 years without parental consent, or refusing to participate, were not included in the study.

Private interviews were conducted for the gathering of demographic, clinical, and obstetric data, including information on UI symptoms. Women with any complaint of involuntary urinary loss were considered incontinent [1]. Previously validated questions adapted from Rohr et al. [25], were used to classify UI as “urge”, “mixed”, or “stress”. Other urinary symptoms such as voiding frequency, nocturia, nocturnal enuresis (involuntary voiding of urine during sleep), and incontinence during sexual intercourse were also investigated [1].

All women classified as incontinent were asked to respond to the Portuguese version of the King's Health Questionnaire (KHQ) [26]. The KHQ was developed in 1997 for the assessment of quality of life in patients with urinary incontinence by Kelleher et al. [3]. It has 21 items representing eight domains: general health perception, UI impact, role limitations, physical limitations, social limitations, personal relationships, emotions, and sleep/energy. The KHQ also contains two other independent scales that evaluate UI severity (severity measures), as well as urinary symptoms. These scales offer the following choices: “not at all”, “a little”, “moderately” and “a lot”; or “never”, “sometimes”, “often” and “always”. Exceptions are the domains general health perception (“very good”, “good”, “fair”, “bad” and “very bad”) and personal relationships (“not applicable”, “not at all”, “a little”, “moderately” and “a lot”), which present five choices. Rather than an overall score, the KHQ provides a 0-100 score for each domain where higher scores indicate worse quality of life related to that domain [26].

Taking into account the proportion of incontinence among diabetic women (40%) and the probability of incontinence occurrence during pregnancy (45%) reported in the literature, and assuming a type I error of 5% and a type II error of 20%, the minimum sample size was estimated as 33 pregnant women per group.

Based on an initial exploratory data analysis, categorical variables were expressed as proportions and continuous variables, which did not follow a normal distribution, were reported as medians. Proportions and medians were compared by the Chi-square test and the Mann-Whitney test, respectively. Statistical data analysis was performed using IBM SPSS Statistics, v.20.0, with significance level set at 5%.

Results

Of the 102 pregnant women enrolled, 69 were NG (67.6%) and 33 were HG (32.4%). Median age among NG and HG participants was 26 and 31 years, respectively. Gestational age significantly differed between groups. Most women were married, pregnant for the second time, had completed high school, and reported no regular alcohol consumption or smoking. The prevalence of UI defined as “Have you ever experienced involuntary urine loss?” was 55.9%.

The KHQ was administered to 57 incontinent women - 37 from the HG group (53.6%) and 20 from the NG group (60.6%). This difference in the proportion of UI occurrence between groups was not statistically significant.

Table 1 shows that there were significant differences between groups regarding the scores for KHQ domain scores general health perception, UI impact, personal relationships emotions, and sleep/energy whereas

	HG (n=20)			NG (n=37)			Valor-p*
	p25	p50	p75	p25	p50	p75	
General health perception	25.00	25.00	50.00	0.00	25.00	25.00	0.001
UI impact	33.33	33.33	66.67	33.33	33.33	33.33	0.002
Role limitations	8.33	33.33	58.34	0.00	0.00	33.33	0.054
Physical limitations	0.00	33.33	58.34	0.00	16.67	33.33	0.118
Social limitations	11.11	19.45	45.83	0.00	16.67	27.78	0.064
Personal relationships	0.00	0.00	29.17	0.00	0.00	0.00	0.012
Emotions	11.11	33.33	63.89	0.00	0.00	33.33	0.012
Sleep and energy	33.33	66.67	100.00	16.67	66.67	66.67	0.035
Severity measures	20.00	33.33	51.67	16.67	26.67	43.34	0.313

Table 1: KHQ domain scores by group. * Mann-Whitney U Test.

no significant differences were found in role limitations, physical limitations, social limitations and severity measures. It is worth of note that HG scores were lower for all KHQ domains.

Discussion

Rather than diagnosing UI, this study aimed at assessing if UI symptoms affected the quality of life of pregnant women with GDM. Urodynamic assessment is considered the gold standard for a precise diagnosis [27,28], particularly when a surgical approach is required. However, when conservative strategies are adopted, there is still debate about its use because, as stated by the ICS [1], self-reported urine loss is a reliable measure of the symptom [26].

Consistently with other reports [15,16,29-33], the prevalence of UI was high among the pregnant women participating in this study, with no significant difference between groups.

The assessment of the KHQ general health perception domain showed that NG women rated their health status at the moment as “good”, whereas women with GDM classified their status as “regular”. This finding is in accordance with Kim et al. [23], who found that women with a history of GDM had poorer self-rated health than women without it.

In response to the question “how much do you think your bladder problem affects your life?”, most NG women answered “not at all” while HG women responded “a little”. This is in agreement with Dolan et al. [34], who used the KHQ to establish the prevalence and effect of urinary incontinence on quality of life during pregnancy and after parturition. They concluded that most women with urinary incontinence experience minimal impact on quality of life during pregnancy. According to Santos et al. [5], women describe the discomfort caused by UI during pregnancy as milder than that experienced before pregnancy probably because UI is considered to be a natural consequence of pregnancy, and the appearance of other uncomfortable symptoms may lead them to rate the impact of urine loss as minor.

Kocaoz et al. [35], in a study of 393 pregnant women, found that their quality of life was either unaffected or very little affected by urinary incontinence. In addition, they also observed that only a few of those women sought help from a healthcare professional [36-38].

Other investigators demonstrated that only a minority of UI patients seek help for their condition, and that when they do it, their major concern is the odor of urine [39-41]. This concern was also reported by both NG and HG women participating in our study.

In our study, pregnant women from both groups rated the impact of urinary incontinence as minor. However, several studies have suggested that incontinence in pregnancy may be a risk for incontinence later in

life. Thus, IU should not be considered as a natural consequence of pregnancy, especially because some strategies, such as kinesiotherapy, may be used to attenuate its symptoms.

The lack of difference in the role limitations and physical limitations domain scores observed between the NG and HG groups indicated that UI had little impact on the daily life of our study's participants. In contrast, Kim et al. [14] found that 49% of women with a recent history of GDM, reported greater than weekly incontinence, and approximately a quarter reported incontinence that interfered with activity during and after pregnancy.

Conclusions

Our results show that UI was highly prevalent in both NG and HG women. However, UI impact was higher on pregnant women with hyperglycemia and GDM who had poorer KHQ scores in all domains, especially general health perception, UI impact, emotions, and sleep/energy.

The high prevalence of UI during pregnancy alone justifies investigation. Our findings, however, suggest that assessing quality of life during pregnancy can be helpful in the implementation of preventive interventions and thus reduce UI occurrence and negative impact on the quality of life of pregnant women, particularly those with hyperglycemia and GDM

Authors' contributions

All authors contributed extensively to the work presented in this paper at all stages, and also read and approved the final manuscript.

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