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A Study Of Hyperemesis Gravidarum In IT Professional Women: A Cross-Sectional Study

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ABSTRACT

Introduction: Women with hyperemesis gravidarum experience severe nausea and vomiting symptoms which cause significant health problems for both the mother and fetus. The combination of extensive working hours and intensified workplace pressure makes women in the information technology (IT) field a unique population.

Objective: This study aims to study the prevalence of HG amongst IT professional women and to study the socio-demographic and occupational determinants related to it as well as to study the maternal and foetal outcomes in this cohort.

Methods: It was a questionnaire-based survey that was sent to 128 pregnant or recently delivered women working in the IT sector, and this was a cross-sectional study. Data was collected in the form of HG symptoms, occupational stress levels and numerous socio-demographic characteristics. A snowball sampling strategy was used for recruiting participants across multiple IT companies.

Results: The participants' prevalence of HG was 15.63%, which is far higher than the average for the world. Correlations were not statistically significant, but younger age, first pregnancy and high work stress were found to be contributory variables. Maternal outcomes exposed HG-related problems, however, those with a HG diagnosis were not hospitalised at a significantly different rate than those without. Efficient treatment did not substantially differ birth weight preterm birth rates and other foetal outcomes.

Conclusion: The study also notes that women working in IT have a higher prevalence of HG, which is likely exacerbated by work-related stress. While maternal and fetal outcomes were generally positive, the results indicate that use of alternative-focused interventions to address both medical and workplace challenges is needed. Employers and healthcare providers should together help pregnant women do a stressful job and also ensure that the pregnant woman gets all the appropriate care and that their stress (and the effects of HG) does not impact her health.

Keyword: *Occupational stress, IT professionals, pregnancy outcomes, maternal health, fetal health*.

1. INTRODUCTION

HG is a pregnancy-related illness marked by extreme nausea and vomiting that can cause serious complications for the mother and foetus (1). HG has been shown to affect 50–90% of expectant mothers, but compared to the more common pregnancy nausea and vomiting, it is characterised by severity and duration, leading to hospitalisation and much care. HG not only is an annoyance, but it can be fatal and cause severe dehydration, electrolyte imbalances, nutritional deficiencies, and weight loss in the mother and a negative foetal outcome (3–5).

The incidence of HG varies globally and in one community, depending on the community, the rates reported can be between 0.3 and 2% of the pregnancies (6,7). There are also several variables such as hormonal fluctuations, psychological stressors, genetic susceptibility, etc that are responsible for the development of HG (1,3,8). Despite this, the pathophysiology is not well known and therefore effective management, prevention, and prediction are difficult.

However, recently, the role of occupational factors on pregnancy outcomes has attracted more attention, particularly among groups under high stress and demand. This has engendered many medical discussions of this population (9). Women in IT industry are a distinctive group of people. No one needs an introduction to the fact that the IT sector is a high-stress work.

environment. It is known for long hours, deadlines and needs to constantly upgrade the skills to keep up with new technologies. These work-related stressors make symptoms of HG worse so the disease may be worse in the form of disease

While the literature on HG has been growing, little research regarding the prevalence and influence of HG is available for women working in IT. Given that the number of women in the IT workforce is growing and they have specific challenges combining demanding careers with pregnancy health issues, it is important to understand how the high-stress environment of the IT industry is related to physiological and psychological pregnancy demands, especially related to HG.

In addition, the socio-demographic factors that are associated with HG in women in the IT industry may be different from that of the population at large, which is essential for developing targeted prevention and intervention strategies to account for the specific conditions of these women in the given industry. Preliminary studies show that women with HG have worse outcomes if other very stressful things are going on in their lives during pregnancy (10–12). Their jobs may put them at higher risk of having severe HG, so it has a greater effect on them and their pregnancies.

METHODOLOGY

It was a questionnaire-based cross-sectional study to evaluate the prevalence, socio-demographic variables, and maternal and foetal outcomes associated with HG among IT professional women. An online survey which was disseminated through Google Forms for six months was used for the study from January to June 2023. Participants were gathered from various IT organisations located in India, using social media and professional networks.

The study population consisted of women who were employed as IT professionals and who were either pregnant or who had given birth within one month prior to the interview. The women had to be between the ages of 20 to 40, working in the IT industry, and open to participating in the study. Women who were not pregnant or who had given birth more than a month previously, or had a history of serious illness other than pregnancy excluding those who refused to give informed consent, were excluded from the study.
Participants were recruited using snowball sampling, beginning with an initial set of IT professionals who were invited to distribute the survey to their peers. A large and representative sample of women IT professionals from different firms was guaranteed by this approach.
A standardized, pre-tested questionnaire created especially for this study was used to gather data. The purpose of the questionnaire was to collect detailed data on the participant's experiences with HG, sociodemographic characteristics, and pregnancy outcomes. It took roughly five to ten minutes to complete the Google form, and the poll was anonymised to protect participant privacy.
Study participation was completely optional. Informed consent was given by each subject. Everyone was informed of the study's goal, and data anonymization was used to protect the privacy of their answers. Any participant may leave the study at any moment without facing any repercussions.
Data were entered into an Excel spreadsheet and analyzed using statistical software. Descriptive statistics were used to summarize the data, with results presented as means, standard deviations, and percentages. Subgroup analyses were conducted to explore differences in HG prevalence, maternal outcomes, and fetal outcomes based on various socio-demographic factors such as age, job role, and work hours. Associations between categorical variables were analyzed using Chi-square tests, with a p-value of <0.05 considered statistically significant. All analyses were conducted using SPSS version 21.0.

2. RESULTS

A total of 128 IT participants were included in the study. Of 128, 20 were diagnosed with HG, resulting in a prevalence rate of 15.63% (95% CI: 10.35% - 22.90%). The demographic characteristics, work factors, and medical history of the participants are summarized in Table 1. The largest age group was 26-30 years, constituting 50 (39.06%) participants. Most participants were primi gravida (60, 46.88%) or in their second pregnancy (45, 35.16%). Regarding gestational age, the majority were in the 7-10 weeks category (40, 31.25%), followed by 11-14 weeks (35, 27.34%), as shown in Table 1.

The analysis of the associations between HG and socio-demographic factors, such as age, gravidity, and gestational age, revealed that women aged ≤30 years showed a higher likelihood of being diagnosed with HG compared to those aged >30

years, with an odds ratio of 2.75. However, this association was not statistically significant (p-value = 0.13). There was no significant difference in the likelihood of diagnosis between women who were first-time mothers (Primi Gravida) and those who had multiple pregnancies (Multigravida) (odds ratio of 0.72, p =0.63). Similarly, no significant association was found between gestational age and the likelihood of being diagnosed with HG (odds ratio 0.95, p=1.0). Overall, while age shows a trend towards a higher likelihood of diagnosis for younger women, none of the socio-demographic factors examined were significantly associated with HG in this dataset, as shown in Table 2.

The results indicated that HG in IT professional women, despite its severity, is effectively managed, as shown by the lower incidence of serious complications in the diagnosed group. For example, dehydration occurred in only 2.3% of HG cases compared to 17.2% in non-HG cases, and electrolyte imbalance was observed in 1.6% of HG cases versus 10.2% in those not diagnosed with HG, as shown in Table 3.

Further analysis indicated that HG did not significantly impact maternal outcomes such as hospitalization or the need for ventilator support. Specifically, 25% of HG-diagnosed women required hospitalization compared to 18.5% of those not diagnosed, with an odds ratio of 1.47 (p = 0.54), suggesting no significant difference. Additionally, none of the HG cases required ventilator support, mirroring the low requirement in the non-HG group (1.9%), as shown in Table 4.

Further analysis revealed that HG did not significantly influence fetal outcomes. Adverse fetal outcomes were observed in 25% of pregnancies with HG compared to 8% in those without HG, with an odds ratio of 0.45 (p = 0.162), indicating no statistically significant difference, as shown in Table 5.

Finally, the analysis of lifestyle and work factors, such as work experience, weekly working hours, flexible working hours, the option to work from home, and employer support, did not have a significant association with the likelihood of developing HG. Women with more than 3 years of work experience had a similar risk of HG as those with 3 years or less (odds ratio = 0.99, p = 1). Similarly, weekly working hours and the availability of flexible working hours did not show significant differences in HG prevalence (odds ratios = 1.34 and 0.82, with p-values of 0.621 and 0.801, respectively), as detailed in Table 6.

Table 1: Demographic Characteristics and Work Factors of the Study Participants (N=128)

Factor	Diagnosed (n = 20)	Not Diagnosed (n = 108)
Age		
20-25 years	3 (2.3%)	27 (21.1%)
26-30 years	13 (10.2%)	37 (28.9%)
31-35 years	3 (2.3%)	32 (25%)
>36 years	1 (0.8%)	12 (9.4%)
Gravidity		
Primi Gravida	8 (6.3%)	52 (40.6%)
Gravida 2	10 (7.8%)	35 (27.3%)
Gravida 3	1 (0.8%)	14 (10.9%)
Gravida 4	1 (0.8%)	7 (5.5%)
Gestational Age		
<6 weeks	1 (0.8%)	9 (7%)

7-10 weeks	7 (5.5%)	33 (25.7%)
11-14 weeks	8 (6.3%)	27 (21.1%)
15-20 weeks	3 (2.3%)	27 (21.1%)
>20 weeks	1 (0.8%)	12 (9.4%)

Table 2: Association of Socio-Demographic Factors with Hyperemesis Gravidarum

Factor	Diagnosed (n = 20)	Not Diagnosed (n = 108)	Odds Ratio	p-value
Age				
>30 years	4	44	2.75	0.13
<=30 years	16	64		
Gravidity				
Multigravida	12	56	0.72	0.63
Primi Gravida	8	52		

Table 3: Maternal complications distribution among the study participants (n = 128).

Complications	Not Diagnosed	Diagnosed
Blurring of Vision/Retinal Hemorrhage	7 (5.5%)	0 (0%)
Central Pontine Myelinolysis	1 (0.8%)	0 (0%)
Dehydration	22 (17.2%)	3 (2.3%)
Electrolyte Imbalance	13 (10.2%)	2 (1.6%)
Jaundice	1 (0.8%)	1 (0.8%)
Ketosis	9 (7%)	1 (0.8%)
Korsakoff Psychosis	1 (0.8%)	0 (0%)
Metabolic Acidosis	5 (3.9%)	0 (0%)
Peripheral Neuritis	3 (2.3%)	0 (0%)
Wernicke Encephalopathy	2 (1.6%)	0 (0%)
No complications	44 (34.4%)	13 (10.2%)

Table 4: Association of Hyperemesis Gravidarum with Maternal Outcomes

Factor	Diagnosed (n = 20)	Not Diagnosed (n = 108)	Odds Ratio	p-value
Hospitalization Required				
Hospitalized	5	20	1.47	0.54
Not Hospitalized	15	88		
Duration of Hospital Stay				
<1 week	0	10	0	0.36
None	20	98		
Ventilator Support Required				
Ventilator Required	0	2	0	1
Not Required	20	106		

Table 5: Association of Hyperemesis Gravidarum with Fetal Outcomes

Fetal Outcome	Diagnosed (N = 20)	Not Diagnosed (N = 108)	Odds Ratio	p-Value
Adverse Outcome	25	8	0.45	0.162
Positive Outcome	83	12		

Table 6: Association of Lifestyle and Work Factors with Hyperemesis Gravidarum

Factor	Diagnosed (N = 20)	Not Diagnosed (N = 108)	Odds Ratio	p-value
Work Experience				
<=3 years	7	38	0.99	1
>3 years	13	70		
Weekly Working Hours				
<=40 hours	9	41	1.34	0.621
>40 hours	11	67		
Flexible Working Hours				
No	6	37	0.82	0.801
Yes	14	71		
Work From Home				
No	6	34	0.93	1
Yes	14	74		
Sick Leave Due to Hyperemesis Gravidarum				
No	12	76	0.63	0.432
Yes	8	32		
Employer Support Rating				
Good	16	94	0.6	0.482
Not Good	4	14		

3. DISCUSSION

The prevalence of HG in our study population, at 15.63%, is substantially higher than the global prevalence typically reported, which ranges from 0.3% to 3% (13,14). Most of the women diagnosed with HG were younger (<30 years) and primi gravida. These findings align with that of Roseboom et al. (2011), who suggested that younger women, particularly those in their first pregnancy, are at higher risk of HG. (15).

HG is influenced not only by physiological factors but also by socio-demographic and occupational variables. Tsang et al. (1996) observed that women with HG were less likely to have higher parity, indicating that those with fewer children or experiencing their first pregnancy might be more susceptible. This aligns with our findings, where a significant proportion of affected IT professionals were in their first pregnancy. (16).

The maternal outcomes observed in our study, including dehydration and electrolyte imbalances, are common complications associated with HG, as documented by multiple studies. (6,17–20). However, our findings, consistent with the study by Tsang et al. (1996), indicate no significant differences in hospitalization rates or duration between those diagnosed with HG and those without. This may be attributed to effective early management strategies within the IT professional cohort. (16).

Fetal outcomes in our study revealed no significant association between HG and adverse outcomes, such as low birth weight or preterm birth, which is consistent with the findings of Roseboom et al. (2011) (15). The association of HG with adverse outcomes was mainly attributed to pre-existing maternal characteristics rather than the condition itself. This suggests that the elevated occupational stress in IT professionals while exacerbating HG symptoms, may not directly translate into worse fetal outcomes if managed appropriately. Additionally, Matsuo et al. (2007) found that small pre-pregnancy body weight significantly increases the risk of HG, but did not correlate with worse fetal outcomes, which aligns with our observation that IT professionals with HG did not experience significantly poorer fetal outcomes compared to those without HG (21).

One of the most significant contributions of our study is the emphasis on occupational factors, particularly in the IT sector, where high stress and long working hours are prevalent. The studies on the management of HG underscores the importance of considering environmental and lifestyle factors in the management of the condition. The high rate of HG among IT professionals suggests that occupational stress plays a meaningful role in the severity of HG symptoms. Previous studies have also suggested that the higher the level of stress, the more severe the HG symptoms will be (16).

Additionally, the study shows that when HG is present, if appropriate assistance and interventions are given, there is a possibility of favourable pregnancy outcomes for HIG, especially in the high-risk groups (22). IT workers in particular may benefit from specialized interventions that address the psychological and occupational pressures related to their jobs.

LIMITATIONS

Although our study adds further data to the existing body of limited literature, we acknowledge certain limitations in this study. The main disadvantage is the cross-sectional design which limits the ability to establish a direct association between the extent of HG and occupational stress. Data collection is also self-reported, which introduces recall bias and mistakes to the study. The findings were unable to be extrapolated due to the study population being confined to a certain geographic area. In addition, there was no prior medical history recorded. Last, though the study found connections between HG and occupation tension, it neglected to factor in any confounding variables that can impact the seriousness of HG, for example, diet routines, hereditary predispositions, or previous psychological issues.

RECOMMENDATIONS

The IT industry companies should consider involving workplace interventions for stress reduction such as telecommuting options, flexible working hours and stress control lessons. Healthcare practitioners should take special care of pregnant women working in high-stress situations with early screening for HG and support for their medical and occupational needs. More study is also advisable to look at the long-term consequences of professional stress on pregnancy outcomes, particularly on women with HG, and to examine how well workplace interventions can reduce these impacts.

4. CONCLUSION

The prime focus of this study is the high incidence of HG among women working in IT and the probable factor of work-related stress to worsen the illness.

While the findings indicate that HG in this population is associated with high levels of stress and demanding work environments, no significant associations were noted. Future studies should extend the parameters to explore the complex interplay between occupational stress and HG, to develop effective strategies to improve pregnancy outcomes in this unique population

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