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Menstrual Irregularities, Urogenital Symptoms and Hormonal Changes Among Nurses of the Delivery Rooms in Menoufia Governorate, Egypt

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Abstract

Objective: to assess the effect of occupational stress on menstrual cycle, urogenital and hormonal changes among nurses working in the delivery rooms.

Methods: a cross-sectional study included 162 nurses (exposed group) and 114 administrative workers (non-exposed group). Demographic, medical and occupational data were collected followed by clinical examination and laboratory investigations. Outcome measures included menstrual disorders, urogenital symptoms and hormonal changes.

Results: there is a highly significance of shift works, heavy lifting, standing duration and perceived job stress in the exposed group ($p<0.001$). More nurses experienced menstrual cycle irregularity, abnormal cycle pattern, urogenital symptom in addition to higher serum prolactin ($p<0.001$).

Conclusion: Occupational stress may be linked to an increased risk for menstrual disorders, urogenital symptoms and altered hormonal milieu in nurses working in the delivery rooms.

Keywords: Hormonal Changes; Menstrual Irregularities, Nurses of the Delivery Rooms; Urogenital Symptoms,

Introduction

Work stress-related health effects have been thoroughly investigated with consistent associations with disorders of the cardiovascular [1], neurological and musculoskeletal systems [2,3]. However, less evidence is available on the negative sequalae on women's reproductive health in terms of menstrual cycle disturbances, urogenital symptoms and hormonal milieu. Some studies confirmed an association between occupational stress and menstrual disorders [4,5] and others refute such association [6]. Many risk factors have been implicated in the increasing rates of urogenital infections among working women which include poor sanitation, low educational levels, immigration and occupational stress [7,8].

The aim of this study was to assess the occupational stress effect on menstrual cycle, urogenital complaints and hormonal changes among nurses working in the delivery rooms in Menoufia governorate, Egypt.

Materials and Methods

This was a cross-sectional study carried out at the department of Public Health and Community Medicine in collaboration with

Obstetrics & Gynecology and Medical Biochemistry departments at Menoufia Faculty of Medicine, Menoufia, Egypt in the period between the beginning of March 2018 and the end of December 2018.

The Medical Ethics Committee at the Menoufia Faculty of Medicine approved the study protocol and an informed consent was obtained from all participants before starting the study.

All female workers of reproductive age that were working in Delivery rooms (served as study or exposed group) and workers in the hospital administration offices (served as non-exposed group), were called from Menoufia University hospital and 11 Central hospitals in Menoufia governorate. Women who had worked for 5 years at least were invited to participate in the study. 'Nurses were solely working in labor and delivery for the duration of the study period and not shifted to the operating room or attended any surgical procedure requiring general anesthesia'.

Women with known endocrine or Gynecologic diseases, using hormonal or mechanical method of contraception, pregnant and lactating women as well as those with active urinary or genital tract infections were excluded from the study.

376 women working in the delivery rooms and hospital administration offices were invited to participate in the study, 26 women declined to participate, and 40 women were excluded. Out of 310 enrolled women, 20 women dropped out (did not come to the hospital for laboratory work-up). So, 276 women completed the study, 162 women working in the delivery rooms (exposed group) and 114 women served as non-exposed **(**Figure 1: The flow diagram).

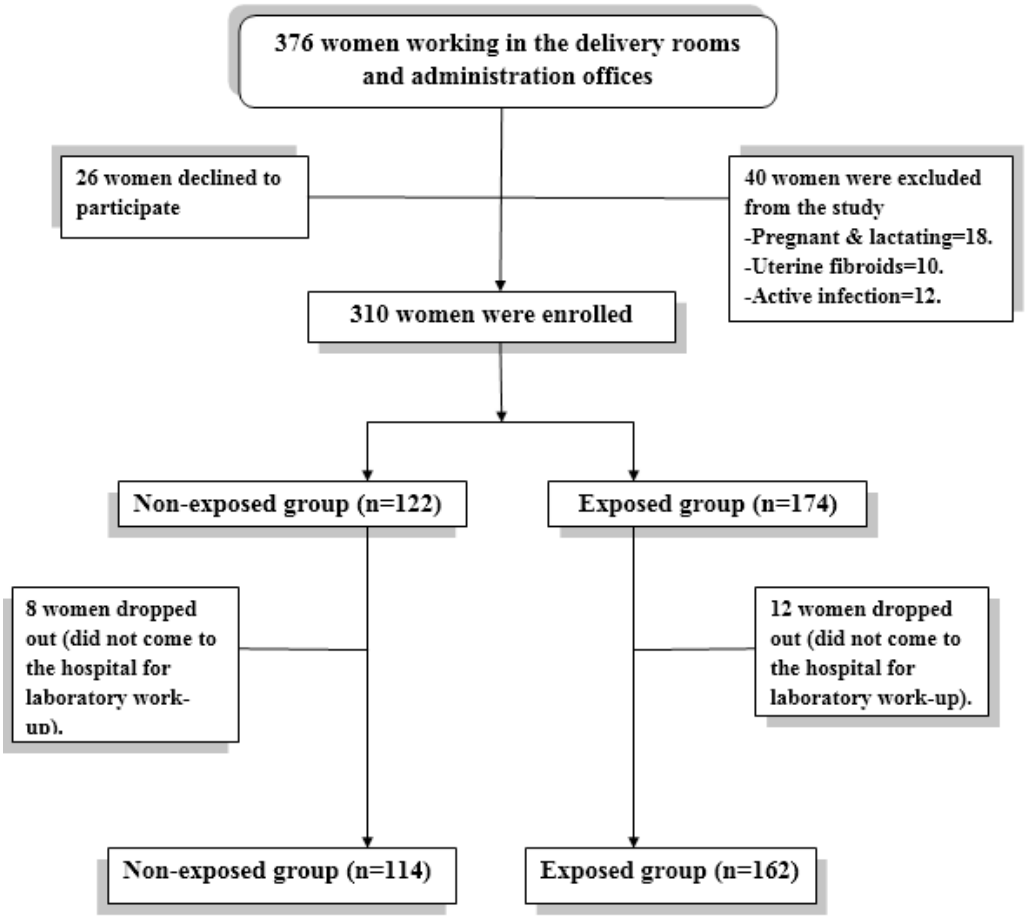

Figure 1: Flow diagram of recruitment and retention of participants in the study.

Demographic, medical and occupational data were collected through direct interviews and a pre-designed questionnaire followed by thorough clinical examination and laboratory investigations.

Working at times other than normal daylight hours of approximately 7:00 AM to 6:00 PM was considered as shift work [9]. Self-perceived work satisfaction and self-perceived work stress levels were classified for each worker: ("low, medium, and high" for work satisfaction and "none, low, medium, and high" for work stress levels) [10].

Clinical examination entails general examination with recording of vital signs, weight, height, breast and thyroid gland examination followed by pelvic examination and transvaginal ultrasonography to exclude women with active genital tract infection or with organic lesions affecting the menstrual cycle as uterine fibroids.

Participants' urine analysis and baseline blood samples were obtained in the early morning while fasting, 2–3 days after the commencement of spontaneous menstrual bleeding to assess serum levels of FSH, LH and prolactin.

Radio immuno assays were used to determine serum levels of LH (Autodelfia; Wallac Oy, Turku, Finland), FSH (Enzymun ES700; Böhringer Mannheim, Mannheim, Germany), and prolactin (Immunotech, Westbrook, ME, USA). Normal values of hormonal levels were: FSH = 3-13 mIU/ml, LH = 1.5-12mIU/ml and Prolactin= 2-22 ng/ml.

Outcome Measures

-Menstrual disorders: irregular cycle is defined as 7-days or more change occurred earlier or later than expected in the last 3 menstrual cycles. Oligomenorrhea is cycle length more than 35 days while abnormal uterine bleeding is any genital bleeding that differs in the amount, duration or frequency of the woman's own cycle.

-Urogenital symptoms include dysuria (burning micturition), Frequency (more than 5 times/day), dyspareunia (pain during sexual intercourse), abnormal vaginal discharge (in colour, amount or odour) and vulval itching.

-Hormonal profile: serum levels of day 3 FSH, LH and prolactin.

Statistical Analysis

Data were collected, tabulated, statistically analyzed by computer using SPSS version 16 (SPSS Inc, Chicago, IL, USA). Quantitative data are expressed in Mean (x) and Standard Deviation (SD). In analytic statistics, Chi-square (x2) and t-test were used. Logistic regression was used to assess the association between the risk of menstrual and urogenital disorders and demographic characteristics. Covariates exhibiting an association with disorders ($p<0.05$) were included when developing univariate and multivariate logistic regression analyses.

All these tests were used as tests of significance at:

• P value > 0.05 was considered statistically non-significant.

• P value ≤ 0.05 was considered statistically significant.

•P value ≤ 0.001 was considered statistically highly significant.

Results

Table 1 reveals the demographic data of the participants. There were no significant differences between the two groups regarding age, body mass index, marital state, parity, age of menarche, educational level and consumption of tea or coffee ($p>0.05$).

	Exposed (n=162)	Non-exposed (n=114)	Student t-test	P-value
Age (year)	30.9±3.6	31.1±3.4	1.16	0.24
Body Mass Index (Kg/m²)	22.8±2.5	22.6±2.8	0.62	0.53
Marital state				
Single	88	64	0.03*	0.8
Married	74	50		
Parity	2.3±1.1	2.1±1.4	1.33	0.18
Age of Menarche (year)	11.4±1.9	11.6±1.6	0.92	0.35
Educational level				

Low	42	34	0.33*	0.56
Medium	54	36		
High	66	44		
Tea &/or coffee consumption	96	66	0.01*	0.9
*Chi-square test				

Table 1: Demographic data**.**

Table 2 depicts the occupational data of the participants. Although, there was no significant difference between the two groups regarding duration of employment and perceived job satisfaction (p>0.05), there is a highly significance of shift works, heavy lifting (>10 Kg), standing duration (>3 hours) and perceived job stress in the exposed group (p<0.001).

	Exposed (n=162)	**Non-exposed (n=114)**	**Chi-square test**	**P-value**
Duration of employment (year)	10.6±4.2	10.2±4.9	0.73*	>0.05
Shift work	146	56	55.2	<0.001
Heavy lifting (>10 Kg)	96	38	16.9	<0.001
Standing duration (>3 hours)	126	42	45.3	<0.001
Perceived job satisfaction				
Low	28	18	0.03	>0.05
Medium	122	90	0.31	>0.05
High	12	6	0.21	>0.05
Perceived job stress				
None	0	0	_	_
Low	34	88	83.4	<0.001
Medium	112	16	79.4	<0.001
High	16	10	0.01	>0.05
***Student t-test**				

Table 2: Occupational data.

Table 3 shows menstrual irregularities, urogenital complaints and hormonal changes among participants. More women in the exposed group experienced menstrual cycle irregularity (p<0.001), abnormal cycle pattern (p<0.05), urogenital symptom in the form of dysuria, dyspareunia, vaginal discharge (p<0.001), and frequency (p<0.05), in addition to higher serum prolactin (p<0.001) compared to the non-exposed group.

	Exposed (n=162)	**Non-exposed (n=114)**	**Chi square test**	**P-value**	**Odd's ratio (†CI at 95%)**
Menstrual cycle					
Regular	**106**	**98**	13.59	0.0002	0.31 (0.17-0.57)
Irregular	56	16			
Cycle pattern					

Oligomenorrhea	26	8	4.25	0.03	2.53(1.1-5.8)
Abnormal uterine bleeding	30	8	6.52	0.01	3.01(1.33-6.84)
Urogenital symptoms					
Dysuria	48	14	10.59	0.001	3.01(1.57-5.78)
Frequency	36	12	5.58	0.018	2.43(1.2-4.9)
Dyspareunia	54	16	12.16	0.0004	3.06(1.65-5.7)
Vaginal discharge	62	18	15.36	0.00008	3.31(1.82-5.99)
Vulval pruritus	40	22	0.83	0.36	1.37(0.76-2.46)
Hormonal Profile					
-FSH (mIU/ml)	6.2±1.6	5.9±1.9	1.42*	0.15	_
-LH (mIU/ml)	5.4±1.8	5.7±1.2	1.55*	0.12	_
Prolactin (ng/ml)	29.3±6.9	12.3±4.2	23.42*	<0.001	_
*Student t-test					
†CI=Confidence interval					

Table 3: Menstrual irregularities, urogenital complaints and hormonal changes among exposed compared to non-exposed participants.

Table 4 reveals the associations between menstrual irregularities and study variables using logistic regression analysis. Shift work, heavy lifting (>10 Kg), standing duration (>3 hours), perceived job stress was associated with higher rates of menstrual irregularities.

Variable	Adjusted OR	†CI 95%	P-value
Shift work	4.46	2.02-9.85	<0.001
Heavy lifting (>10 Kg)	6.25	2.75-14.19	<0.001
Standing duration (>3 hours)	13.44	5.45-33.6	<0.001
Perceived job stress	9	3.83-21.17	<0.001
†CI=Confidence interval			

Table 4: Associations between menstrual irregularities and study variables using logistic regression analysis.

Table 5 shows the associations between urogenital complaints and study variables using logistic regression analysis. Shift work, heavy lifting (>10 Kg), standing duration (>3 hours), perceived job stress was associated with higher rates of urogenital complaints.

Variable	Adjusted OR	†CI 95%	P-value
Shift work	9.36	7.12-18.32	<0.001
Heavy lifting (>10 Kg)	11.76	5.06-22.28	<0.001
Standing duration (>3 hours)	8.04	7.54-18.1	<0.001
Perceived job stress	4	1.87-8.55	<0.001
†CI=Confidence interval			

Table 5: Associations between urogenital complaints and study variables using logistic regression analysis.

Discussion

To our knowledge, this is the first study to examine the relationship between occupational stress and menstrual disorders, genitourinary symptoms and hormonal changes in nurses working in the delivery rooms.

In the current study, menstrual cycle irregularity affects 56/162 nurses (34.5%) with 16% experienced oligomenorrhea or abnormal uterine bleeding and 18.5% experienced dysmenorrhea during the past three months with 69.1% of the studied nurses report medium perceived job stress. Irregular cycles and dysmenorrhea have impact on women's physical health and quality of life, as they reduce the efficiency of their work [11].

Dysmenorrhea was observed in 63.3% of 150 midwives in a recent prospective study with 59.3% of the studied midwives had severe occupational stress. There was a significant positive correlation between occupational stress and severity of dysmenorrhea [12]. The symptoms of menstruation are not only a result of biological factors, but they are also affected by social factors and psychosocial conditions of working environment [13,14].

In this study, 29.6% of nurses suffer from dysuria, 22.2% from frequency, 33.3% from dyspareunia, and 38.3% from abnormal vaginal discharge in the absence of gross Genito-urinary infection.

Occupational stress may be linked to an increased risk for urogenital infection, among the 638 women working in export factories in China, in which, 30.9% reported at least one urogenital symptom, 27.9% reported abnormal discharge, 2.4% reported genital sores, and 6.3% reported pain with urination [15]. In this series, a mild to moderate elevations in serum prolactin above normal levels was observed in the exposed group. Stressful life events and perceived stress were linked to increased stress biomarkers principally serum prolactin in a recent case-control study [16].

Shift work, heavy lifting (>10 Kg), standing duration (>3 hours), perceived job stress was associated with higher rates of menstrual disorders and urogenital complaints.

Decreasing psychological demands in the workplace may be essential for reducing stress, and thus improving women's reproductive health [12].

Further studies are warranted to identify nurses with persistent symptoms and to implement better accessibility to reproductive health services.

Conclusion

Occupational stress may be linked to an increased risk for menstrual disorders, urogenital symptoms and altered hormonal milieu in nurses working in the delivery rooms.

Conflict of interest: none declared.

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