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Effect of Nursing Job on Fertility Potential of Nurses in Babylon Province

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Abstract: *Objective***:** The aim of the study**:** To study the effect of nursing job on nurses fertility potential. *Back ground*: Fertility potential refers to the ability of couples to reproduce and depends on both female and male partners. Human Fertility Potential is a very sensitive process which can be influenced by many factors such as jobs opportunities. Fertility potential can be measured by ovarian reserve markers. *Methods*: This is a case control study conducted in Hilla Teaching hospital and Babylon teaching hospital for maternity and pediatric; form: May 2015 - November 2015. Fifty women were included in this study working as nurses in gynecological and obstetric department (Number =50) and eighty-one women as a control group (Number = 81). Assessment of effect of nursing job was done by standard questionnaire and basal Hormonal levels (follicle stimulating hormone, estradiol hormone, prolactin hormone and thyroid stimulating hormone) were determine women by using (mini VIDAS) method. *Result*: There is a significant difference in the residence, educational level, menstrual cycle regularity between nurses and control group ($p<0.05$). Significant differences ($p<0.05$) were identified in cycle day two serum level of Estradiol and Prolactin hormones, between the nurses group and control group .

Conclusion: Nurses working in gynecological and obstetric wards are liable for the effects of shift work which may disturb circadian rhythm and may cause cycle irregularities and alter endocrine function and possibly the regulation of reproductive hormones and fertility.

Key words: Fertility potential, follicle stimulating hormone, estradiol hormone, prolactin hormone, thyroid stimulating hormone, nursing job.

1. Introduction

The potential for reproduction is influenced by gamete production, fertilization and carrying a pregnancy to term .Human fertility depends on many factors such age, nutrition, sexual behaviour, consanguinity, culture, instinct endocrinology, timing, economics, way of life, and emotions and job stresses [1] . Fertility potential can be measured by ovarian reserve which is a term that used to determine the capacity of the ovary to provide egg cells that are capable of fertilization resulting in a healthy and successful pregnancy [2] Markers of ovarian reserve include age, follicle stimulating hormone, estradiol, anti mullerian hormone. Inhibin hormone and ultrasonic markers.[3].,[4] Human reproductive failure may include:Infertility, recurrent pregnancy loss (spontaneous miscarriages or abortions and preterm birth) and ectopic pregnancy [5].The Causes may include environmental and lifestyle factors, congenital malformations, endocrine disorders, immunologic abnormalities and squeal of genital tract infections [6]. Workplace hazards can affect a woman reproductive health, her ability to become pregnant, or the health of her unborn children [7].Hormonal imbalance and exposure to environmental toxins may affect the reproductive capability of couples [2]. Reproductive toxicity is the occurrence of adverse effects on reproductive system that may results from exposure to toxin and environmental agents. Toxicity may include alteration in reproductive organs and /or the related endocrine system [8].The magnitude of occupational and environmental reproductive health risks in modern society is still being studied .The negative correlation between women's employment and fertility is well documented, but such study haven't be conducted in my Babylon province.

2. Aim of the study

1. To asses' fertility potential in nurses working in obstetrics and gynaecology department. 2. To study the effect of nursing job on fertility potential of these nurses by comparing them with healthy fertile none employed women.

3. Subjects and Methods:

This case control study conducted in Hilla Teaching Hospital and Babylon teaching hospital for maternity and pediatric in Al Hilla city in Iraq from May to December 2015. Fifty nurses were included in this study after exclusion of other 40 nurses who refuses to give blood samples for hormonal analysis ,their mean age was (29.1± 8.08) ranging from (17-45) years ;and eighty one women as a control with mean age (31.84 ± 8.48) ranging (19-47) years. All women were asked a standard questionnaire which include (age, level of education, menstrual cycle regularity, living area (rural or urban), menstrual cycle pattern, infertility history and duration .Medical , surgical history and gynecology and obstetrics history were taken. Complete examinations were done including weight and height to calculate body mass index. Cycle day two measurement of follicle stimulating hormone (FSH), estradiol hormone(E2), prolactin hormone and thyroid stimulating hormone(TSH) were determined by (mini VADAS) method.

3.1. Statistical analysis: Statistical analysis was done with statistical package for social science (SPSS, Inc., Chicago, IL, version 20 for windows).Continuous variables were expressed as mean ± slandered deviation (SD) and range ;categorical variables as percentages. Between groups, differences were tested with compare means – independent samples *t*- test for continuous parameters and non-parametric tests – Chi-square. A *p* value of < 0.05 was considered significant for all analysis.

4. Results:

4.*1. Comparison of socio demographic data of nurses and control groups.*

There is significant difference in the residence, educational level, menstrual cycle regularity of the females of two groups (p<0.05).

Table (1): Comparison between nurses and control groups according to socio-demographic characteristics

Parameters	Hospital group (N=50)	Control group (N=81)	P-value
Age (years)	29.1± 8.08	31.84 ± 8.48	p>0.05
BMI Kg/ m2	26.87 ± 3.78	26.40 ± 3.48	p>0.05
Age of menarche(years)	12.34 ± 1.02	12.56 ± 0.9	p>0.05
Residence N (%) Rural Urban	 18 (28.9) 32 (71.1)	 78(96) 3 (4)	P<0.05*
Educational level N (%) Primary or secondary school Higher education	 0 (0.0) 50 (100.0)	 81 (100.0) 0 (0.0)	P<0.05*
Menstrual cycle regularity N (%) Regular Irregular	 15 (21.1) 25 (78.9)	 81 (100.0) 0 (0.0)	P<0.05*
Duration of bleeding days N (%) (3-5) (5-7) (≥ 7)	 18 (28.9) 26 (55.3) 6 (15.8)	 19 (23) 56 (69) 6(8)	p>0.05

*p value ≤ 0.05 was significant.

4.2 .Comparison between nurses and control groups according to basal hormonal profile

Significant differences ($p<0.05$) were identified in cycle day two serum level of Estradiol, and Prolactin hormones, between nurses and control group.

Table (2) Comparison between nurses and control groups according to basal hormonal profile

Parameters	Hospital group (N= 50)	Control group (N=81)	P-value
FSH mUI/ml	6.73 ± 4.55	7.07 ± 2.91	p>0.05
E2 pg/ml	56.95 ± 40.37	40.89 ± 15.56	P<0.05*
Prolactin level µU/ml	24.22 ± 27.32	10.83 ± 5.32	P<0.05*
TSH µU/ml	1.67 ± 0.55	1.54 ± 0.90	P>0.05

E2 : Estradiol , FSH: Follicle stimulating hormone , TSH: Thyroid stimulating hormone
***p value ≤ 0.05 was significant.**

5. Discussion:

This study evaluate the effect of nursing job on menstrual cycle pattern and fertility potential of nurses working in gynaecology and obstetrics ward.

There were higher significant nurse's lives in urban area than control. This may be due to the fact of migration which exerts both direct and indirect effects on urban population growth [9]. Leaving the village for employment is a fairly new phenomenon that has occurred as a product of industrialization and globalization. Nurses have significantly higher educational levels than control as in table (1). This can be explained by the fact that high percentage of working women lives in urban places ,were colleges are available ,or it may be due to local social consideration that those who lives in rural areas don't agree to send their daughters to the center. Women of all educational backgrounds had delayed marriage, although the delay has been longer among the more highly educated who have attended college [9].

Regarding menstrual cycle irregularities which are significantly higher in nurses (79% of nurses have irregular cycle). There is accumulating evidence that menstrual cycle characteristics are the most direct measures of spontaneous reproductive health, fertility, and pregnancy outcome in the general population [10];[11], [12]. In a study done by Zhang and coworkers in China, they found that high levels of occupational stress had increased risk of dysmenorrhea and menstrual irregularities in warking women , [13]. Lawson and colloquies in 2011, concluded that shiftwork was modestly associated with menstrual cycle irregularity [14].

Boczek-Leszczyk and Juszczak found that melatonin levels varied significantly between night and day shift workers, while LH and FSH levels did not, suggesting that the menstrual irregularity associated with shift-work could be explained by melatonin fluctuations.[15] Shift work may affect glucose tolerance and induce obesity and systemic arterial hypertension in addition to disturb hypothalamic pituitary axis in these nurses [16].

There is highly significant difference in serum levels of E2, prolactin; all are significantly higher in nursing women table (2). The production and release of nearly all hormones exhibit a diurnal timing patterned on approximately a 24-hour cycle. Lifestyle factors (e.g., night shift work, sleep disruption) and exposures to light-at-night may disrupt circadian rhythm may therefore also alter endocrine function and possibly the regulation of reproductive hormones [17]. Melatonin appears to be involved in the regulation of gonadal function by affecting the release of gonadotropins (LH and FSH) from the pituitary and stimulating ovarian estrogen production and release. Human studies point to a possible role of melatonin in the release of LH, FSH, and estrogen (suggesting a mechanism whereby decreased concentrations of circulating melatonin (such as those brought about by circadian disruption) could result in increased release of estrogen by the ovaries [18]. There is higher significant level of prolactin level in nurses group, rotating shift work stress and physical activity of these nurses mat be responsible for the significantly higher prolactin levels[19]. Hyperprolactinemia is associated with ovulation disorders [20], sterility[21], [22] and menstruation disorders [23], [24].

6. **Conclusion**: Nurses working in gynecological and obstetric wards are liable for the effects of shift work which may disturb circadian rhythm which may lead to cycle irregularities and may alter endocrine function and possibly the regulation of reproductive hormones and fertility.

Recommendation:

A multicenter studies should be done in our country and compare the results with other countries studies to see if these hormonal changes are due to the effect of job alone or it may be due to the effect of wars and their effects; that our country have been exposed to.

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