



## The Effect of Lunar Cycle on the Frequency of Birth in Al-Elwiya Maternity Hospital, Baghdad, 2017

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### ABSTRACT

**Background:** For ancient period, moon has been held responsible for many biological activities. The moon has long been thought to have physical effects on human beings especially women. The menstrual cycle, conception, delivery and even fertility have been closely linked to the moon's cycles. **Aim:** The relation of lunar phases to the birth rate has been the focus of considerable research with still controversial results. This study attempts to dispel or lend significance to beliefs among hospital staff that the moon phases are related to birth rate and possible relationship between lunar position at time of delivery, the gender of the child and multiple pregnancy outcome. **Subject and Method:** A single center retrospective cohort study was performed at Al-Elwiya Maternity Teaching Hospital, Baghdad, Iraq. Analysis of 8395 spontaneous deliveries, which occurred from 1st of January to 31st of December 2016, sorted by month. We performed one-way analysis of variance (ANOVA) test on these deliveries during period of lunar cycles. **Results:** We evidenced an increase in the percentage of deliveries in the Waning Gibbous (15.64%) and the full moon (14.70%). **Conclusion and recommendations:** Our study displays that birth rates are correlated with the phases of the moon. For this reason, the number of nurses and doctors in obstetric units must be increased during these periods.

**Keywords:** Lunar cycle, Birth, Delivery, Pregnancy

### INTRODUCTION

Many people and even among nurses of obstetrics wards believe that the moon phases affect the onset of labor and that, the full moon raises the number of births. According to previous studies, all mammalian cells seem to possess internal biological clocks [1]. There seem to be three major divisions. These are (1) coming signals, such as hormonal factors for the target tissues; (2) the clock itself; and (3) the output genes [2,3].

Neurophysiologist regarded sleep-wake rhythm, body temperature; the levels of melatonin, cortisol and growth hormone in the blood are governed by a circadian rhythm, hypothalamus, by the suprachiasmatic nucleus, in order to ensure the programming of the adaptive response to external changes. Specially, the day/night cycle is transposed as an input from the retinal photoreceptors, to the central nervous system (CNS), which in turn regulates the cycle of sleep and watch. In addition, during night, the exposure to light suppresses the synthesis of melatonin which is secreted by the pineal gland [4].

Sarkar and Biswas have noted that the vaginal pH of women during the ovulatory phase [5] coinciding with the full moon, was alkaline (pH  $8.7 \pm 0.4$ ), while the ovulation, during the three previous days, was slightly acidic (pH  $6.2 \pm 0.5$ ); the temperature of the body was increased ( $+0.5^\circ\text{F}$ ) in women who had ovulated at the full Moon phase; additionally they have associated the alkaline environment and the basal temperature of the body with the conception of male infants.

Among other motives, this interest has inspired researchers to investigate the effect of the lunar cycle and other natural phenomena such as, for example, precipitation temperature variations, and barometric pressure on pregnancy and labor [6-13]. Closely related papers analyzed other potential effects of the lunar cycle, such as the effect of the full moon on animal bites [14,15], crime [16] and urinary retention [17]. The role of radiation and geomagnetic disturbances on human health outcomes have been investigated less extensively. Existing evidence indicates, for example that solar activity is correlated with human conceptions [18-21], human life span [22,23] and other health outcome variables.

In this research, we tried to look at some evidence for and against the lunar effect on birth rates in Iraq using a large data source covering the birth in 2016 and find out if labor wards should be increasing their staff numbers. Also, we tried to find out why so many people believe in the effect.

**SUBJECT AND METHODS**

A single center retrospective study was performed at Al-Elwiya Maternity Teaching Hospital, Baghdad, Iraq. We performed an analysis on 8395 spontaneous deliveries, which occurred from 1<sup>st</sup> of January to 31<sup>st</sup> of December 2016, sorted by month. We got the medial records in the approval from the hospital. We considered the 8 phases of the moon which are New Moon (Day 1-3), waxing crescent (Day 4-6), First Quarter (Day 7-9), waxing gibbous (Day 10-13), Full Moon (Day 14-17), waning gibbous (Day 18-21), Last Quarter (Day 22-25), waning crescent (Day 26-28).

We performed one-way analysis of variance (ANOVA) test to determine whether there are any statistically significant differences between annual total spontaneous deliveries happened in the different lunar phases, total number of males and females born in the different lunar phases, the total multiple pregnancy occurred in different lunar phases in one lunar cycle.

**RESULTS**

A total of 8395 women were included in this retrospective study. Table 1 shows the distribution of number and percentage of deliveries in relation to lunar phases in one lunar year.

**Table 1 Distribution of number and percentage of deliveries with significant level of association with lunar face in one lunar year**

Moon phases	No.	%	p-value
New Moon, Day (0-3)	946	11.27%	0.001
waxing crescent, Day (4-6)	915	10.90%	
First Quarter, Day (7-9)	921	10.97%	
waxing gibbous, Day (10-13)	1142	13.60%	
Full Moon, Day (14-17)	1234	14.70%	
waning gibbous, Day (18-21)	1313	15.64%	
Last Quarter, Day (22-25)	1080	12.86%	
waning crescent, Day (26-28)	844	10.05%	

There is a statistically significant difference in the number of total spontaneous deliveries according to lunar phase (p=0.001), depending on considered moon phase, we evidenced an increase in the percentage of deliveries in the waning gibbous (15.64%) and the full moon (14.70%).

Table 2 shows the distribution of total number of births according to lunar phases and gender with p value (0.219) of no significance.

**Table 2 Distribution of total births according to lunar face and gender**

Moon faces	Male	Female	p-value
New Moon	474	472	0.219
waxing crescent	477	438	
First Quarter	500	421	
waxing gibbous	599	543	
Full Moon	611	623	
waning gibbous	675	638	
Last Quarter	536	544	
waning crescent	411	433	

Table 3 shows the distribution of number and percentage of deliveries according to months and it was statistically significant (p=0.001%).

**Table 3 Distribution of number and percentage of deliveries with significant level of association with month**

Percentage	Number of deliveries	Month
7.72%	648	January
7.53%	632	February
6.76%	568	March
6.54%	549	April
6.66%	559	May
7.77%	652	June
9.24%	776	July
9.10%	764	August
9.22%	774	September
9.49%	797	October
9.68%	813	November
10.28%	863	December

The highest percentage of deliveries occurred in December (10.28%), followed by July, August, September, October, November (9.10% to 9.68%), January, February, June (7.53% to 7.77%) and the lowest percentage of deliveries occurred in March, April, May (6.54% to 6.76%).

Table 4 shows the distribution of number and percentage of multiple pregnancy outcome in relation to lunar phases in one lunar year.

**Table 4 Distribution of number and percentage of multiple pregnancy outcome with significant level of association with lunar face in one lunar year**

Moon faces	Number of deliveries	Percentage%	p-value
New Moon	20	13.51%	0.982
waxing crescent	15	10.14%	
First Quarter	14	9.46%	
waxing gibbous	24	16.22%	
Full Moon	20	13.51%	
waning gibbous	23	15.54%	
Last Quarter	15	10.14%	
waning crescent	17	11.49%	

According to Table 4, we found out no significant difference between the numbers of multiple pregnancy outcome in relation with moon faces ( $p=0.982>0.05$ ).

**DISCUSSION**

Data of this study focused on the lunar cycle effect on frequency of birth. These results suggest that the gravitation of the Moon may have an influence on the frequency of births. Here our study deal with daily data where it is much easier to associated individual observation with the corresponding phases of moon which collected from one hospital.

The results in Table 1 display the effect of lunar cycle in frequency of birth and there is marked increased in numbers of birth in waning gibbous phase of the moon, this means that the moon in one of its phases affects the proportion of births. A study by Abell and Greenspan, [24] on 11691 deliveries in 51 lunar cycles shows no correlation between the rate of birth and the moon cycle. Data performed by other authors [25], with a cohort study of the same amount, has not reported statistically significant differences in the frequency of deliveries during the different moon phases. And in another contrary research [26,27] Oliver Kuss and Anja Kuehn [28] conducted a retrospective cohort analysis on 4,071,669 live and stillbirths and found that there is no association of the lunar cycle and the number of births from south-west Germany. But Randall’s [29] report parallel with this study that the gravitation may have an influence on our body more than we have known before and this is parallel with this study.

In conclusion, consideration of the influence of the Moon on the tides led, over the centuries, to believe that it may

cause the premature rupture of membranes (PROM), by an effect on the pressure of the amniotic fluid of pregnant women, and that, change of pressure could thereby inducing labor. The study of Lentz, et al., [28] investigated the synergistic relationship between gravitational and barometric pressure forces in relation to the physiology of pregnancy, reporting that neither the barometric pressure gradients nor the size has a significant effect on human gestation and that gravitational influences of the new and full moons have had no effect on the rate birth.

Generally, by complex interactions of the hypothalamic-pituitary axis, the ovaries, and the genital tract, the progression of spontaneous and regular ovulatory menstrual cycles is regulated. The hormonal system plays roles in the labor system [25]. In women, the duration of the cycle of reproductive age is approximately 28 days, which is very similar to a moon cycle [26]. The hormonal system controls labor may be regulated by moon gravitation. According to previous studies, all mammalian cells seem to possess internal biological clocks [29].

In Table 2, there is no correlation between lunar cycle and gender. In contrast, there is an effect of full moon and new moon on male and female offspring according to the study of Indian couples of ages group 20 to 40. It was observed that 42 females who were conceived within 24 hours of ovulation at full moon gave birth to 40 male and 2 female babies [30].

In our study according to Table 4 there is no correlation between multiple pregnancy outcomes and lunar cycle which is performed on 148 twins delivered in one lunar year which there is no obvious increase in numbers of twins in any phase of the moon. Any other study about the correlation between lunar cycle and the frequency of multiple pregnancy outcomes was hardly seen.

### CONCLUSION

An analysis of one-year data at Al-Elwiya Maternity Teaching Hospital, Baghdad, Iraq demonstrated linear correlation between increased frequency of spontaneous births and periods of Waning Gibbous.

### Recommendations

Our data allow us to conclude that there is need to increase the number of nurses and doctors in obstetric units during the period of Waning Gibbous.

### DECLARATION

### Conflict of Interest

The author discloses no potential conflicts of interest, financial or otherwise.

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