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THE INFLUENCE OF THE LUNAR CYCLE IN LABOR AND LOW-RISK DELIVERY

A influência do ciclo lunar no trabalho de parto e parto de baixo risco

La influencia del ciclo lunar em el trabajo de parto y parto de bajo riesgo

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ABSTRACT

Objetive: to identify the relationship between the phases of the moon and the onset of labor in parturients attended at a high-risk maternity hospital. **Method:** cross-sectional study, with retrospective data collection from a high-risk maternity hospital in Curitiba, Paraná, in 2018. Data were collected between March and May 2021 and statistically analyzed. **Results:** a total of 1,963 hospitalizations were analyzed, predominantly women between 20 and 29 years old (58.5%), primigravidae (41.4%), with 39 weeks of gestation (25.9%), vaginal delivery (87.4%), assisted by physicians (44.2%) and obstetric nurses (43.6%). The highest number of hospitalizations was in the Last Quarter (26.5%); no significant differences were found between the number of hospitalizations on the days of the moon phase change in relation to the others (p= 0.942). **Conclusion:** the lack of relationship between the lunar phases and the onset of labor helps to unravel popular beliefs about pregnancy and childbirth.

DESCRIPTORS: Pregnant Women, Parturition; Labor Onset; Moon; Obstetric Nursing;

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RESUMO

Objetivo: identificar a relação das fases da lua com o início do trabalho de parto de parturientes atendidas em uma maternidade de risco habitual. **Método:** estudo transversal, com coleta retrospectiva de dados de uma maternidade de risco habitual em Curitiba, Paraná, em 2018. Os dados foram coletados entre março a maio de 2021 e analisados de forma estatística. **Resultados:** foram analisados 1.963 internamentos, prevaleceram mulheres entre 20 a 29 anos (58,5%), primigestas (41,4%), com 39 semanas de gestação (25,9%), nascimento via vaginal (87,4%), atendidos por médicos (44,2%) e enfermeiros obstetras (43,6%). O maior número de internamentos foi na fase Quarto Minguante (26,5%); não foram encontradas diferenças significativas entre o número de internamentos nos dias de mudança de fase da Lua em relação aos outros (p= 0,942). **Conclusão:** a não relação das fases lunares com o início do trabalho de parto auxilia a desvendar crenças populares sobre gestação e parto.

DESCRITORES: Gestantes; Parto; Início do Trabalho de Parto; Lua; Enfermagem Obstétrica;

RESUMEN

Objetivos: identificar la relación entre las fases de la luna y el inicio del trabajo de parto en parturientas atendidas en una maternidad de alto riesgo. **Método:** estudio transversal, con recolección retrospectiva de datos de una maternidad de alto riesgo en Curitiba, Paraná, en 2018. Los datos fueron recolectados entre marzo y mayo de 2021 y analizados estadísticamente. **Resultados:** se analizaron un total de 1.963 ingresos, predominantemente mujeres entre 20 y 29 años (58,5%), primigrávidas (41,4%), con 39 semanas de gestación (25,9%), parto vaginal (87,4%), asistidas por médicos (44,2%) y enfermeras obstétricas (43,6%). El mayor número de internaciones fue en el Último Trimestre (26,5%); no se encontraron diferencias significativas entre el número de hospitalizaciones en los días de cambio de fase lunar en relación a los demás (p= 0,942). **Conclusión:** la falta de relación entre las fases lunares y el inicio del trabajo de parto ayuda a desentrañar las creencias populares sobre el embarazo y el parto.

DESCRIPTORES: Mujeres Embarazadas; Parto; Inicio del Trabajo de Parto; Luna; Enfermería Obstétrica.

INTRODUCTION

A gestação é uma experiência que envolve não só a mulher, masPregnancy is an experience that involves not only the woman, but also her family and social context, and is permeated by socio-cultural, spiritual, psychological and emotional aspects. It is also a period that involves various beliefs and practices that influence the care of the mother--child binomial and the way people around her care for her. These are often passed down through the generations and, therefore, it is common for the teachings of the women who make up her family and social nucleus to be valued, so that cultural conceptions exert an influence on daily life, in such a way as to be questioned or verbalized in the midst of consultations and guidance from health professionals.[1]

It is important to note that each culture has unique and varied beliefs, practices and superstitions, particular to each geographical space, cultural, historical and economic context. These are passed down through the generations and shape lifestyles, care, disease prevention and health maintenance.[1]

One of the oldest and best-known beliefs relates women's health to the phases of the moon. There is a belief that menstrual cycles are counted by the lunar month. This connection between women and the lunar phases is also present in the idea that fertility and childbirth vary according to the moon.[2]

There are a number of explanations for this influence. The first is that there are nine cycles of the moon during pregnancy, from fertilization to childbirth.[2] Another is that the moon governs the planet's liquids, so in addition to the 60% of the body composed of water, the pregnant woman also has amniotic fluid, which increases this ratio. For these and other reasons, there is a belief that the moon, especially its full phase, has a direct influence on the onset of labor.[3] Culture and popular knowledge are known to have an influence on pregnancy, labor and childbirth, mainly due to the interference of the people around the woman, since the cultural environment interferes with individuals.[4] It is based on beliefs and practices, passed down between generations and which are different for each group of the population, that lifestyles, care, disease prevention and health maintenance are formed.[1]

An integrative review of beliefs and practices during pregnancy, covering 14 articles, showed that several of the studies mentioned the importance of care during pregnancy as a form of protection. Some practices are common in various cultures, such as the use of medicinal plants, for example. On the other hand, other women avoid using certain teas as a way of preventing miscarriage. Some cultures in Peru believe that natural products should only be used when their properties are known and with the help of people who understand the subject, such as healers and midwives.[1]

As well as the basis of the first calendars and the development of agriculture, various cultures believe that the moon also has a relationship with fertility, pregnancy and childbirth. In addition to popular belief, some obstetricians also observe a greater demand for births during the full moon phases.[5]

For some of these professionals, the moon has a direct influence on the gestational cycle and they are encouraged to relate the increased demand for births to the lunar cycles. This supposed influence has taken root in popular culture and involves mysticism, astrology and science.[3]

This supposed influence has become popular and involves mysticism, astrology and science, since it is based on two explanatory factors: the influence of the full moon on the onset of labor and on the planet's fluids, which would be related to human body composition. For some ancient peoples, the light of the moon influences the growth of plants and the conception of animals, so it was believed that women would also have this relationship.[3] This connection between women and the lunar phases is also present in the fact that fertility and childbirth vary according to the moon.[2]

However, health care needs to be based on these cultural values, respecting the practices of women and the people around them, in order to ensure that pregnancy and childbirth are humanized.[4] For some health professionals, the moon has a direct influence on the gestational cycle and they are encouraged to relate the increased demand for childbirth to the lunar cycles. This supposed influence has taken root in popular culture.[3] It is known that there is an influence of culture and popular knowledge, such as that surrounding the interference of the lunar phases in the onset of labor. However, research on the subject has been carried out over the years, albeit not to any great extent, and is scarce at national level. With this in mind, the research question in this study was: what is the relationship between the phases of the moon and labor in patients treated at a regular risk maternity hospital? and the aim was to identify the relationship between the phases of the moon and the onset of labor in patients treated at a regular risk maternity hospital.

METHOD

This is an analytical study, with a quantitative approach and retrospective collection of secondary data, based on spreadsheets and record books from the Obstetric Center of a regular risk public maternity hospital in the city of Curitiba, Paraná. The center attended an average of 200 deliveries a month, of which 70% were vaginal deliveries and 30% caesarean sections (data provided by the maternity hospital) and an average of 1,000 emergency room visits a month. However, due to the COVID-19 pandemic, this maternity hospital was closed and restructured to serve the adult public due to the country's health needs. The data was gathered and the documents were collected and organized throughout 2021.

The data that made it possible to carry out an analysis consistent with reality came from the obstetric center's patient entry book between January and December 2018, totaling 3,533 admissions. For the inclusion criteria, we selected care for pregnant women who were admitted to the obstetric center due to spontaneous labor at term and whose outcome was non-induced vaginal delivery or emergency c-section. Therefore, 1,963 admissions were considered eligible for the study.

The data was collected and organized in a spreadsheet containing the variables for analysis: date of admission, medical record number, patient's age, time of admission, reason for admission, gestational history, gestational age, induction, route of birth, reason for c-section, time of birth, professional category. The days of the change in the moon were considered according to the calendar (https://www.calendarr.com/brasil/calendario-lunar-2018/):day 0 (day of the change), day -1 (day before the change) and day +1 (day after the change).

The data was analyzed in the second half of 2022 and a descriptive analysis of the data was carried out, estimating the mean, median, standard deviation, 25% and 75% percentiles of the quantitative variables and the simple and relative frequencies of the qualitative variables. The quantitative variables were tested for normal distribution using the Shapiro-Wilk normality test to determine the parametric and non-parametric approach. To analyze variables without normal distribution, the difference between two groups was checked with the Mann-Withney U-test and 3 or more groups with the Kruskal-Wallis test. The chi-square or Fisher's exact test was used to assess differences between qualitative variables. Bar graphs and boxplots were produced to better visualize these analyses. All tests were considered significant when $p<0.05$ and the analyses were carried out in the R 4.0.4 environment (R Core Team, 2021). The development of this research complied with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE Statement) checklist for cross-sectional studies.

The research was approved by the Human Research Ethics Committee of the study site under opinion number 3.819.181, on February 3, 2020, meeting all the ethical prerogatives emanating from the legislation regarding the ethical exercise in scientific research in force in Brazil.

RESULTS

With regard to the number of hospitalizations, the daily average identified was 5.39 pregnant women. As for the time of day when these admissions took place, 551 (28.1%) were in the morning, from 6:00 to 11:59 am; 402 (20.5%) in the afternoon, from 12:00 to 5:59 pm; 447 (22.8%) in the evening, from 6:00 to 11:59 pm; 557 (28.4%) from midnight to 5:59 am; and 6 (0.3%) had no recorded time. Thus, 953 (48.5%) hospitalizations occurred during the day and 1,004 (51.1%) at night.

We also identified 15 reasons or clinical conditions for which parturients were admitted to the Obstetric Center. The highest number of reasons was described as spontaneous labor, with 1,612 (82.1%) admissions, followed by 177 (9.0%) admissions due to a ruptured bag, followed by blank or illegible reasons (58-3.0%). Data on the profile of these cases can be seen in Table 1.

Table 1 - Births according to the phases of the moon during the year analyzed. Curitiba, PR, Brazil, 2022

Variable		N	%	IC 95%	
				Inf	Sup
Moon phase	New Moon	475	24,2	22,35	26,14
	First Quarter Moon	479	24,4	22,55	26,35
	Full Moon	488	24,86	23	26,82
	Last Quarter Moon	521	26,54	24,63	28,54
Type of day	Phase change day	802	40,86	38,7	43,05
	Other days	1161	59,14	56,95	61,3
Month of delivery	January	202	10,29	9,02	11,71
	February	193	9,83	8,59	11,23
	March	192	9,78	8,54	11,17
	April	175	8,91	7,73	10,26
	May	178	9,07	7,88	10,42
	June	166	8,46	7,31	9,77
	July	150	7,64	6,55	8,9
	August	144	7,34	6,26	8,57
	September	130	6,62	5,6	7,81
	October	151	7,69	6,59	8,96
	November	156	7,95	6,83	9,23
	December	126	6,42	5,42	7,59
Procedure	CST	247	12,58	11,19	14,12
	PN	1716	87,42	85,88	88,81
Professional who attended	Obstetrician	867	44,17	41,98	46,37
	Obstetric nurse	856	43,61	41,43	45,81
	Doctor and Nurse	52	2,65	2,03	3,46
	Resident	150	7,64	6,55	8,9
	Extra hospital	23	1,17	0,78	1,75

Regarding the outcome of hospitalization, the reasons listed for c-sections were classified into nine groups. The most frequent reason was dystocia and arrest of progression (53-21.46%), followed by cephalopelvic disproportion (38-15.38%) and other gestational problems (35-14.17%) such as oligohydramnios, placental abruption, gestational diabetes mellitus, gestational hypertension, herpes with active lesion and post-dates. This was followed by fetal problems (34-13.77%), which included macrosomia, pelvic fetus, anomalous presentation, meconium, cord prolapse, altered tests and intrauterine growth restriction. This was followed by fetal distress (30-12.15%), iterativity and tubal ligation (29-11.74%), infertile or unfavorable cervix (23-9.31%), ruptured sac (7-2.83%) and at the patient's request (1-0.40%). The majority of caesarean sections were for more than one reason, so the tally was based on how many times each one appeared. For this reason, the sum of these is greater than the number of total surgeries (247-100%).

The profile of parturients admitted to the obstetric center in labor at term is shown in Table 02.

With regard to the number of pregnancies, primigravidas were identified, up to women who were pregnant for the tenth time. Thus, the group called 4 or more pregnancies is divided into pregnant women who were in their fourth pregnancy (130 - 6.6%), fifth pregnancy (51 - 2.6%), sixth pregnancy (22 - 1.1%), seventh pregnancy (12 - 0.6%), eighth pregnancy (1 - 0.1%), ninth pregnancy (1 - 0.1%) and tenth pregnancy (1 - 0.1%).

The analysis of hospitalizations in relation to the phases of the moon is shown in tables 3, 4 and 5, which show that there is no lunar influence on the number of births or on the duration of labor until its end.

Table 2 - General profile of patients admitted to the obstetric center of the maternity hospital in full-term and spontaneous labor. Curitiba, PR, Brazil, 2022

Variable		Phase change day			Other days			
		N	%lin	%col	N	%lin	%col	p-valor*
Time of day	Morning	208	37,75	25,94	343	62,25	29,54	0,309
	Afternoon	166	41,29	20,7	236	58,71	20,33	
	Night	184	41,16	22,94	263	58,84	22,65	
	Dawn	241	43,27	30,05	316	56,73	27,22	
Age group	Not informed	123	40,46	15,34	181	59,54	15,59	
	13 to 19 years old	476	41,46	59,35	672	58,54	57,88	
	20 to 29 years old	177	40,69	22,07	258	59,31	22,22	0,96
	30 to 39 years old	16	38,1	2	26	61,90	2,239	
	40 to 44 years old	10	29,41	1,25	24	70,59	2,067	
Pregnancy	Not informed	341	41,94	42,52	472	58,06	40,66	
	1st pregnancy	241	39,31	30,05	372	60,69	32,04	
	2nd pregnancy	127	43,49	15,84	165	56,51	14,21	0,509
	3rd pregnancy	84	38,53	10,47	134	61,47	11,54	
	4 or more pregnancies	9	33,33	1,12	18	66,67	1,55	
Gestational age	Not informed	46	38,98	5,74	72	61,02	6,202	0,68
	37 weeks	144	41,26	17,96	205	58,74	17,66	
	38 weeks	213	41,93	26,56	295	58,07	25,41	
	39 weeks	175	40,51	21,82	257	59,49	22,14	
	40 weeks	32	33,68	3,99	63	66,32	5,426	
	41 weeks	0	0	0	1	100	0,086	
	42 weeks	192	41,74	23,94	268	58,26	23,08	

*Chi square test

Table 3 - Number of births according to moon phase. Curitiba, PR, Brazil, 2022

Moon phase	M	DP	MD	IIQ	p-value*
New Moon	5,46	3,1	5	4	0,431
First Quarter Moon	5,44	2,41	5	3	
Full Moon	5,19	2,82	5	4	
Last Quarter Moon	5,79	2,75	5	4	

*Kruskal-Wallis test

Table 4 - Number of births by type of day. Curitiba, PR, Brazil, 2022

Type of day	M	MD	DP	IIQ	p-value*
Phase change day	5,49	5	2,79	4	
					0,942
Other days	5,45	5	2,78	4	

*Mann-Whitney test

DISCUSSION

The predominant age group was 20 to 29, followed by 30 to 39. This data is similar to that observed in other studies. In a study of 1,137 parturients in Sobral, Ceará, it was found that maternal age between 21 and 30 was significantly higher than the others.[6] Another study of 272 parturients in Brasília, Federal District, found that 74.18% of them were aged between 20 and 35.[7] In addition, DATASUS also reveals the same pattern, in the most recent sample, from 2019, 48.15% of live births had maternal age recorded between 20 and 29 years.[8]

A survey of 250 puerperal women at a maternity hospital in Uberlândia, Minas Gerais, showed that more than 40% of them had never had a previous pregnancy and more than 30% had only had one previous pregnancy.[9] These data are in line with this study, which showed very close percentages and a significant drop from the third pregnancy onwards. Also, according to the 2010 IBGE Census, the number of children per woman, or fertility rate, has been falling. In the year of the Census, this rate reached an average of 1.9 children, compared to an average of 6.16 children in the 1940s. This significant change has an influence on the age pyramid and population growth.[10]

With regard to gestational age, the concept of term pregnancy encompasses women who are between 37 and 41 weeks pregnant. Above 41 completed weeks, the pregnancy is classified as post-term.[11] In this study, the majority of labor started with parturients who were 39 weeks pregnant, followed by 40 weeks. Only one labor started at 42 weeks gestation. In line with this, a study carried out in a maternity hospital in Santa Maria, Rio Grande do Sul, with 845 parturients, found that 33.6% of deliveries took place at 39 weeks and 36.6% at 40 weeks.[3]

With regard to the outcome of the hospitalization, this study found that most of them culminated in vaginal delivery compared to c-section surgery. However, DATASUS points out the opposite in general data for Brazil, as in 2019, 56.30% of births occurred by c-section.[8] Parallel to this information, the World Health Organization says that an acceptable rate of c-section is 10 to 15%, as rates above this are not associated with

Table 5 - Time between arrival and birth in the maternity ward in relation to phase change day and other days. Curitiba, PR, Brazil, 2022

	Phase change day				Other days				
Variable	M	DP	MD	IIQ	M	DP	MD	IIQ	p-value*
Time in minutes	377,95	340,93	281	411	391,51	344,26	295	459,5	0,35

*Mann-Whitney test

a reduction in maternal and neonatal morbidity and mortality, as surgery is only effective when well indicated. [12] It is important to remember that the analysis in this study only includes hospitalizations for full-term and spontaneous labor, so the results may be altered if we look at all births during the year.

With regard to the professional who provided assistance at the time of the births, this study revealed a similar number of doctors and nurses. This is an important finding and different from what is observed in everyday life. One study estimated that only 0.9% of care in the SUS is provided by nurses.[13] Therefore, nurses' participation in childbirth care is often still insignificant, and overcoming this biomedical model, which is influenced by cultural and historical issues and power relations, is a challenge for these professionals.[14] However, this role is very important, since it is a possibility for reducing maternal and neonatal mortality, as nurses seek to reduce unnecessary interventionist practices, guaranteeing women's autonomy and providing humanized care.[13]

In relation to the lunar phases, this study revealed that they have no relationship or influence on the onset of labor for this sample. Other studies on the subject found in the literature point to a similar conclusion.[3,15,15,16,17,18] A study involving 845 parturients showed that 36.8% of amniotic membrane ruptures occurred on days when the moon's phase changed and 63.2% on ordinary days. The proportions between ruptured and intact sacs also showed no difference in relation to the lunar phases.[3] Another statistical study that analyzed the relationship between 327 spontaneous births and the phase of the Full Moon, found a difference between the number of births that occurred on the Full Moon and those that occurred on other days, but the trend was discordant depending on the month. They therefore concluded that there was no effective relationship.[15] Another study, also with statistical analysis, carried out in India with 9,890 patients, did not have enough evidence to prove any relationship between the Moon and births.[16]

A spectral analysis study involving a larger data set of 4,071,669 births in Germany found sufficient evidence for the hypothesis that the lunar cycle does not influence the number of births.[17] Also, a study carried out in a hospital in Spain, covering 5.476 births, found no statistically significant relationship for the meteorological variables that were researched (temperature, atmospheric pressure and wind speed), nor for the coefficient of births and the lunar phases.[18] Finally, a literature review covering the period from 1975 to 2008, encompassing an average of eight studies, concluded that only one of them showed statistical evidence that there is a connection between births depending on the lunar phase, especially in multiparous women.[5]

CONCLUSION

In conclusion, the study achieved its objective and identified that the lunar phases were not related to the onset of labor in the hospitalizations analyzed. This finding helps to unveil myths and beliefs surrounding pregnancy and childbirth, especially with regard to the changes in the moon, since this is information that has been disseminated between generations and is used empirically in day-to-day care.

This adds to other similar studies in order to provide women with evidence-based information so that the experience of pregnancy and childbirth is a positive one, without the interference of assumptions that can generate anxiety and worry.

In addition, this research contributes to health professionals, as it supports them in demystifying these beliefs in relation to the population they serve. In addition, the study helps to encourage nurses to act in the process of parturition, demonstrating legal support for the practice of the profession, as well as indications that this assistance can bring many benefits to the parturient, with humanized and evidence-based care.

Finally, there is a need to develop a greater number of national studies on the subject of beliefs and myths surrounding pregnancy and childbirth, with an emphasis on the relationship with the lunar phases.

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