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The effect of the lunar cycle on frequency of births and birth complications

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KEY WORDS
Birth
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Objective: The purpose of this study was to examine the influence of the lunar cycle on the frequency of deliveries and/or delivery complications.
Study design: This was a retrospective cohort, secondary analysis of 564,039 births across 62 lunar cycles that were identified from North Carolina birth certificate data from 1997 to 2001.
Results: Using analysis of variance and *t*-tests, we found no significant differences in the frequency of births, route of delivery, births to multigravid women, or birth complications across the 8 phases of the moon or between documented high- and low-volume intervals of the lunar cycle.
Conclusion: An analysis of 5 years of data demonstrated no predictable influence of the lunar cycle on deliveries or complications. As expected, this pervasive myth is not evidence based.

Superstitions are found everywhere in our lives, and medicine, a profession that prides itself on an evidenced-based approach to treatment, is not exempt. One superstition that pervades the labor and delivery floor is that it is busier during certain phases of the lunar cycle, specifically the full moon. If such variations were found in a predictable pattern, it could influence staffing and staff expectations.

Results from previous studies have been equivocal.[1-8] Although some studies have demonstrated an increase in deliveries that are related to the lunar cycle,[4-8] there has been disagreement about when, in the lunar cycle, the peak volume occurs. Researchers have further disagreed as to whether a peak occurs for all deliveries or a subset of deliveries (such as multigravid women and vaginal deliveries) or whether the peak is for the onset of labor. Similarly, confusion exists as to whether the peak relates to the frequency of deliveries or to the frequency of complications. An increase in delivery complications would result in an increase in perceived volume load because of an increased demand on nurses and doctors.

Our primary objective was to examine the influence of the lunar cycle on the frequency of deliveries in North Carolina. Furthermore, we sought to determine whether the perceived volume load that related to delivery complications also varied over the lunar phases.

Methods

We coded 564,039 births in North Carolina birth certificate data (1997-2001) to correspond to the 8 phases of the moon[4,9]: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous,

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Table I Mean number of births per day during the phases of the moon across 62 lunar cycles

Phase of moon	Days (n)	All births (n)	Births not induced (n)	Births to multigravid women (n)	Vaginal delivery (n)
New moon	62	320.0 ± 50.9	262.7 ± 32.9	210.3 ± 37.5	245.6 ± 30.9
Waxing crescent	392	318.7 ± 54.9	260.4 ± 36.7	208.2 ± 40.9	245.5 ± 34.3
First quarter	62	315.8 ± 52.0	260.6 ± 34.5	204.6 ± 37.9	242.1 ± 31.8
Waxing gibbous	404	320.9 ± 55.2	261.2 ± 36.7	210.7 ± 41.2	246.2 ± 33.7
Full moon	62	321.3 ± 52.9	262.1 ± 36.5	210.3 ± 39.9	249.1 ± 33.4
Waning gibbous	387	317.3 ± 54.5	259.4 ± 35.6	207.2 ± 40.1	244.3 ± 34.1
Last quarter	62	322.2 ± 52.0	262.2 ± 35.9	211.7 ± 40.8	247.0 ± 32.5
Waning crescent	395	317.3 ± 53.1	259.3 ± 34.6	208.2 ± 39.5	244.8 ± 33.4
P value*		.97	.99	.90	.95

Data are given as mean ± SD.
* One-way analysis of variance was used, and no significance was found.

Table II Mean number of complicated births per day during the phases of the moon across 62 lunar cycles

Phase of moon	Days (n)	Operative births (n)	Cesarean delivery (n)	Premature rupture of membranes (n)	Premature delivery: <37 wks (n)	Very premature delivery: <35 wks (n)	Birth injury (n)	High-risk delivery (n)	High-risk mother (n)
New moon	62	33.5 ± 8.7	74.5 ± 24.4	10.4 ± 3.8	42.2 ± 10.5	17.2 ± 5.2	1.8 ± 1.6	15.5 ± 4.7	31.7 ± 8.4
Waxing crescent	392	33.0 ± 8.7	73.3 ± 23.8	10.9 ± 3.5	41.0 ± 9.1	17.9 ± 5.1	1.8 ± 1.5	15.7 ± 4.1	31.8 ± 9.5
First quarter	62	32.8 ± 8.2	73.7 ± 23.0	11.5 ± 3.6	40.2 ± 9.6	18.6 ± 5.1	1.5 ± 1.4	16.5 ± 4.7	30.8 ± 9.1
Waxing gibbous	404	33.2 ± 8.2	74.7 ± 24.2	10.7 ± 3.8	39.9 ± 9.3	18.8 ± 5.5	1.9 ± 1.5	15.7 ± 4.5	32.8 ± 9.4
Full moon	62	32.9 ± 8.4	72.2 ± 22.8	10.8 ± 4.2	39.9 ± 8.8	18.2 ± 5.1	1.8 ± 1.4	15.3 ± 4.7	31.3 ± 8.7
Waning gibbous	387	32.3 ± 8.5	73.0 ± 22.8	10.5 ± 3.7	40.7 ± 8.6	18.3 ± 5.6	1.9 ± 1.6	15.1 ± 4.5	31.9 ± 9.4
Last quarter	62	32.8 ± 9.3	75.3 ± 23.4	11.0 ± 3.2	42.7 ± 8.7	18.8 ± 5.7	2.0 ± 1.7	16.0 ± 4.2	33.6 ± 9.8
Waning crescent	395	32.8 ± 8.4	72.5 ± 23.4	10.5 ± 3.5	40.1 ± 8.8	18.3 ± 5.3	1.9 ± 1.5	15.5 ± 4.3	32.3 ± 8.7
P value*		.90	.92	.36	.19	.29	.46	.36	.47

Data are given as mean ± SD.
* One-way analysis of variance was used, and no significance was found.

Figure The 8 phases of the moon: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, last quarter, waning crescent.

last quarter, and waning crescent (Figure). We compared the number of deliveries across these 8 phases for 62 lunar cycles with 1-way analysis of variance for all births, births that were not induced, births to multigravid women, vaginal deliveries, and 9 categories of complicated births: operative deliveries, cesarean deliveries, premature rupture of membranes, premature deliveries (<37 weeks of gestation), very premature deliveries (<35 weeks of gestation), birth injuries, fetal anomalies, high-risk deliveries (labor events: premature rupture of membranes, abruptions, previa, other excessive bleeding, seizures, and cord prolapse), and women who were at high risk (hypertensive diseases, renal disease, Rh-sensitization, uterine bleeding, incompetent cervix, previous macrosomia, and previous preterm delivery).

We recoded birthdates 3 ways to compare time intervals within the lunar cycles that were found to have significantly greater births (high volume) relative to the rest of the lunar cycle (low volume) as identified by previous research: (1) 3 days after full moons,[5-6] (2) 2 days before through 1 day after new and full moons,[7] and (3) the seventh to ninth days after full and new moons.[8] We compared high-volume versus low-volume intervals separately by repeating all analyses using *t*-tests. Significance level was a probability value of <.05. Analyses of publicly available data are exempt from institutional review board review.

Results

We found no significant differences in the number of births that occurred during the 8 moon phases for all birth, births that were not induced, births to multigravid women, or vaginal births (Table I). We further found no significant differences across the phases of the moon for complicated births (Table II). We found no significant differences in the frequency of births between high-volume

Table III Mean number of births per day during "high-volume" versus "low-volume" intervals within lunar cycles

Variable	3 days after full moon (n)	All other (n)	*P* value*	2 days before to 1 day after full and new moon (n)	All other (n)	*P* value*	7-9 days after full and new moon (n)	All other (n)	*P* value*
Days in interval	184	1642		496	1330		372	1454	
All births	315.1 ± 55.3	319.1 ± 53.9	.34	319.6 ± 54.3	318.4 ± 54.0	.67	317.2 ± 52.3	319.1 ± 54.5	.55
Birth not induced	258.8 ± 36.2	260.5 ± 35.7	.55	261.0 ± 35.5	260.1 ± 35.8	.65	259.3 ± 34.4	260.6 ± 36.1	.55
Birth to multigravid women	205.0 ± 40.5	209.1 ± 40.1	.19	209.0 ± 40.4	208.6 ± 40.1	.86	207.8 ± 39.4	208.9 ± 40.4	.63
Vaginal birth	242.9 ± 35.0	245.6 ± 33.4	.32	245.9 ± 33.9	245.1 ± 33.5	.63	244.7 ± 32.6	245.5 ± 33.9	.69
Operative birth	32.0 ± 8.9	32.9 ± 8.4	.15	32.9 ± 8.8	32.8 ± 8.4	.84	32.7 ± 8.6	32.8 ± 8.5	.82
Cesarean birth	72.2 ± 23.6	73.6 ± 23.6	.45	73.7 ± 23.8	73.4 ± 23.5	.77	72.6 ± 22.9	73.7 ± 23.7	.42
Premature rupture of membranes	10.6 ± 3.6	10.7 ± 3.6	.75	10.8 ± 3.6	10.6 ± 3.7	.50	10.8 ± 3.7	10.7 ± 3.6	.61
Premature (<37 wk)	39.9 ± 8.3	40.6 ± 9.1	.34	40.7 ± 9.2	40.5 ± 8.9	.62	40.5 ± 9.0	40.5 ± 9.0	.97
Very premature (<35 wk)	18.2 ± 5.4	18.3 ± 5.4	.83	17.8 ± 5.1	18.5 ± 5.5	.08	18.5 ± 5.5	18.3 ± 5.4	.56
Birth injury	1.8 ± 1.6	1.9 ± 1.5	.90	1.8 ± 1.5	1.9 ± 1.5	.61	1.8 ± 1.5	1.9 ± 1.5	.63
High-risk delivery	15.4 ± 4.6	15.6 ± 4.4	.72	15.7 ± 4.4	15.5 ± 4.4	.24	15.7 ± 4.5	15.5 ± 4.4	.31
High-risk mother	32.2 ± 9.2	31.4 ± 9.2	.24	32.2 ± 9.0	32.1 ± 9.3	.79	32.2 ± 9.1	32.1 ± 9.2	.91

Data are presented as mean ± SD.

* *T*-tests were used in analyses; no significance was found.

and low-volume intervals, regardless of configuration or birth type (Table III).

Comment

Although we found considerable variation in frequencies within phases of the moon, we found no statistical evidence that deliveries occurred in a predictable pattern across the 8 phases of the lunar cycle. We were unable to replicate findings of high-volume intervals within lunar cycles. We found no disproportion in births that were related to obstetric history, medical risks, or delivery complications that might create the perception of increased volume because of increased demands for care.

Research in cognition indicates that we selectively attend to information that is consistent with our beliefs and ignore contradictory information.[10] Those who believe that the full moon increases deliveries will attend more closely to lunar phases with greater than expected deliveries; those who discount the folklore will remember the lulls instead. Despite our findings, we believe that this superstition will likely continue, and some of us will continue to look up and sigh in dread when we see the full moon looking back.

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