Short Communication

Erroneous calculation of the expected date of delivery by medical professionals

Abstract

Background: Naegele's rule, which is used to estimate the expected date of delivery (EDD), presumes that the subject is menstruating regularly every 28 days. For subjects with lengthier or shorter cycles, correction is needed while calculating the EDD. A majority of medical professionals are unaware of this and succumb to errors. The author has published Parikh's formula as an alternative that does not require any additional correction. This study was aimed at evaluating awareness among medical professionals regarding the importance of menstrual history and utility of Parikh's formula in minimizing errors. **Materials and Methods:** One twenty-six medical students and interns from four medical colleges in India and 24 medical officers from a primary health center were enrolled for the study. A questionnaire with a history of a woman with a regular cycle of 35 days was distributed to each participant and they were asked to calculate the EDD. Participants were then educated on Parikh's formula and asked to calculate the EDD again by using that formula. **Results:** Only 10 (6.66%) of 150 participants calculated the EDD correctly by using their conventional methods. After explaining Parikh's formula, this proportion raised to 99%, i.e., 147 of 150 participants, the difference being statistically significant at $P<0.05$. **Conclusion:** A majority of students, interns, and medical officers are unaware of the importance of previous menstrual history while calculating the EDD. If Parikh's formula is used, errors in calculating the EDD can be reduced significantly.

Key words:
Errors by medical professionals, expected date of delivery, Naegele's rule

Introduction

The expected date of delivery (EDD) is traditionally calculated by using Naegele's rule by counting back three calendar months from the first day of the last menstrual period and adding 1 week.[1-3] This rule presumes that the menstrual cycles of the female are regular and of 28 days. Factually the duration of the menstrual cycle averages 28 days, but it may be as short as 20 days or as long as 45 days even in normal women.[4] If a woman gives history of regular, longer or shorter cycles, her EDD obtained by using Naegele's rule needs to be corrected. This fact is not mentioned in the textbooks of obstetrics[1,2,3] routinely used by medical undergraduates. A majority of obstetricians being aware of the origin of this formula and the fact that the leuteal phase of the menstrual cycle is more or less constant at 14 days do make corrections in the EDD if the subjects' menstrual cycles are of longer or shorter duration. Although this elaboration on the correction of the EDD did not find any mention in the commonly used textbooks, a few teachers do explain about this to their students. Students who would have studied the mathematics behind this formula too would be aware of this correction. Unawareness about this correction and strict adherence to Naegele's rule lead to erroneous EDD in women with cycles shorter or lengthier than 28 days. Especially for women with lengthier cycles, the EDD would be wrongly set ahead of the actual EDD by using Naegele's rule. Such subjects suffer from anxiety if the labour pains do not start by the EDD when they are not actually at full term. The author has previously published Parikh's formula

Access this article online	
Website: http://www.cysonline.org	Quick Response Code
DOI: 10.4103/2229-5186.90896	

Rakesh Parikh, Kirti Pandia[1]

Department of Diabetology, S K Soni Hospital, Jaipur,
[1]D Clinarch, Jaipur, Rajasthan, India

Address for correspondence:
Dr. Rakesh Parikh
Department of Diabetology, B 09, Unnati, Towers,
Vidhyadhar Nagar, Jaipur 302 033, Rajasthan, India.
E-mail: drrakeshparikh@gmail.com

to overcome all the problems that arise from the erroneous calculation of the EDD.[5] According to Parikh's formula while calculating the EDD, a constant factor of 7 days in Nagele's rule should be replaced with an individualized factor obtained by subtracting 21 days from the duration of previous cycles. This formula, though strictly is just a mathematical modification of Naegele's rule, has not been formally validated in the pregnant population. The present study was aimed at collecting preliminary data regarding awareness among medical students, interns, and medical officers about the importance of the duration of cycles while calculating the EDD and comparing results of their existing knowledge with the new information, i.e., Parikh's formula.

Materials and Methods

A prospective study was planned among medical students and medical officers. The study required inputs of a participant only on a simple question, and hence no ethics committee approval was obtained. Convenient sampling was done among medical students by obtaining verbal permission from the head of department of various medical colleges. One hundred twenty-six medical students and interns who have completed at least one clinical posting in obstetrics from four different medical colleges in India volunteered to participate; 24 medical officers posted at various primary health centers (PHCs) in India were also enrolled as volunteers. A questionnaire with a complete history of a woman with a regular cycle of 35 days was distributed to each participant. They were asked to calculate the EDD as accurately as possible to the best of their knowledge. The participants were then educated on Parikh's formula and were asked to calculate the EDD of the same subject by using that formula. Questionnaires were grouped into five categories: one each of the four medical colleges and fifth of the participants from PHCs. The number of participants calculating the corrected EDD (with correction for the lengthy cycle) at baseline and after explaining the Parikh's formula in each group was calculated [Table 1] for each group. Proportions of total participants calculating the corrected EDD at the baseline and after explaining Parikh's formula was compared by framing a 2×2 table and applying χ^2 test.

Results

Only 10 (6.66%) of 150 participants calculated the corrected EDD at baseline. After explaining them the Parikh's formula, the number of participants calculating the corrected EDD increased to 147 (99%). This difference in the proportion was statistically significant ($P<0.05$).

Discussion

In the present era, various advanced techniques are available for calculating the EDD. Even then clinical knowledge has its own importance, at least for the purpose of medical education. This study reveals the high prevalence of unawareness among medical professionals regarding the importance of the duration of previous cycles while calculating the EDD. Mathematical acumen is inherently weak among most of the medical professionals. A majority of medical professionals prefer using a formula rather than applying any mathematical logic. An elaboration on mathematics behind the origin of such formulas in textbooks would surely be useful. Moreover, the teachers can contribute by explaining the students the origin of such formulas during their classes.

Table 1: Number of participants calculating the corrected EDD by using their existing knowledge and Parikh's formula in each group

Participants	Total number of participants	Participants calculating corrected EDD	
		Existing knowledge	Parikh's formula
Students from medical college 1	28	4 (14.3)	27 (96.4)
Students from medical college 2	22	4 (18.2)	22 (100)
Students from medical college 3	50	1 (2)	50 (100)
Students from medical college 4	26	1 (3.9)	25 (96.2)
Medical officers	24	0 (0)	24 (100)
Total	150	10 (6.66)	147 (99)

EDD – Expected date of delivery; Figures in parenthesis are in percentage

Several other reaserchers have also objected to the accuracy of Naegele's rule and have suggested modifications in the presumed gestation age of 266 days.[6,7] With most of the obstetricians relying on ultrasound for gestational age, some researchers have even suggested to do away with Naegele's rule,[8] but still the academic value of this rule prevails.

References

1. Donald I. Practical Obstetric Problems; 5th ed. Singapore: P G Publishing Pte Ltd; 1985. p. 918
2. Daftary SN, Chakravarti S, Daftary GS. Holland and Brews manual of Obstetrics; 16th ed. Edinburgh B.I. Churchill Livingstone Pvt. Ltd, 2000; 55.
3. Pritchard JA, MacDonald PC, Gant NF. Williams Obstetrics; 17th ed. Appleton-Century-Crofts/Norwalk, Connecticut: MacGrow Hill Medical Publishing Devision 1985. p. 246.
4. Guyton AC, Hall JE. TextBook of Medical Physiology; 9th ed. Sounders Harcourt Brace and Company Asia Pte Ltd; 1996. p. 1018.
5. Parikh RM, Parikh's formula to minimize errors in calculating expected date of delivery. Med Hypotheses 2007;68:928.
6. Mittendorf R, Williams MA, Berkey CS, Cotter PF. The length of uncomplicated human gestation. Obstet Gynecol 1990;75:929-32.

7. Olsen O, Clausen JA. Determination of the expected day of delivery-ultrasound has not been shown to be more accurate than the calendar method. Ugeskr Laeger 1998;160:2088-90.
8. Saunders N, Paterson C. Can we abandon Naegele's rule? Lancet 1991;337:600-1.

How to cite this article: Parikh R, Pandia K. Erroneous calculation of the expected date of delivery by medical professionals. Chron Young Sci 2011;2:171-3.

Source of Support: Nil, **Conflict of Interest:** None declared