



Short communication

Naegele's rule revisited

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ABSTRACT

Recent literature suggests that Franz Carl Naegele's (1778–1851) rule for estimating the date of delivery has been misinterpreted, resulting in this being brought forward by five days. Baskett and Nagele's work underpinning this argument has become widely accepted and quoted in obstetrical and midwifery textbooks. However, our re-examination of Naegele's original statements does not support the recent findings. On the contrary, the original textbooks of Naegele clearly advise taking the first day of menstruation for the calculation of the date of delivery.

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Introduction

Although, increasingly, pregnant women have an early ultrasound scan, obstetrical experts still calculate the gestational age according to Naegele's rule, adding seven days to the first day of the last menstrual period, counting back three months and then adding one year to arrive at the expected date of delivery. As obstetrical and midwifery textbooks continue to disseminate Naegele's rule of calculation, an interpretation of what Franz Carl Naegele (1778–1851) meant by the rule is still highly relevant, especially in developing countries without adequate access to technology. This article reviews the findings of Baskett and Nagele [1] that argue that Naegele possibly did not start his calculation on the first but on the last day of menstruation, thus giving pregnant women a few additional days to reach the estimated date of delivery. As these findings of Baskett and Nagele have entered well-known textbooks such as "Midwifery" of Pairman [2], clinical implications arise on how to use the rule in the appropriate way, at least for those pregnant women who go over term.

Methods and results

As Baskett and Nagele state, Naegele neither invented the rule nor did he claim to have done so. It may have been the famous Hermann Boerhaave (1668–1738), Professor of Botany and Medicine at Leyden University, who first set down the calculation from which Naegele's rule evolved, as Baskett and Nagele assume. There

are no contemporary publications of Boerhaave's lectures for he discouraged his students from preparing a printed record. Albrecht von Haller attended these lectures around 1727 and published the "Academic Lectures of Hermann Boerhaave" in 1744, six years after his professor's death. The relevant passage from the lecture "On Conception" [3], correctly quoted by Naegele [4], is: "[...] ex centum enim partibus omnino nonaginta et novem fiunt nono mense post menstrua ultima, numerando unam septimanam post menses ultimos, et ab ea epocha repetendo novem gestationis menses". Baskett and Nagele [1] translated this passage as follows: "[...] 'for of one hundred births altogether, ninety-nine came about in the ninth month after the last menstruation by counting one week after the last period and by reckoning the nine months of gestation from that time.'"

The textbook for obstetricians from 1812 [4] is the only work of Naegele to which Baskett and Nagele refer. A consultation of the editions of Naegele's midwifery textbooks in the original makes it clear that Naegele meant the start of the last period. All eight editions of his midwifery textbook from 1830 to 1850 deal with the topic of estimating the date of confinement. In the first edition, a misinterpretation is certainly possible, as he is not very precise in his phrasing: "Die gewöhnlichste Zeitrechnung ist die von der letzten Reinigung" [5], which we translate as: "The most common calculation of the delivery date is that from the last period". In this midwifery textbook, the author does not provide the calculation rule that he had published in his scientific textbook [4]. Beginning with the second edition in 1833, he does, however, give an example on how to calculate the date, but even then it is not quite clear on which day he starts his calculation: "Man rechnet von dem Tage an, wo die Frau ihre Reinigung zum letzten Male gehabt, 3 ganze Monate zurück und zählt dann 7 Tage hinzu; der so gefundene Tag ist alsdann derjenige, an welchem die Niederkunft zu erwarten ist. Hat eine Frau z. B. am 10ten Juni ihre Reinigung zum letzten Male gehabt, so zählt sie 3 ganze Monate zurück – also bis zum 10ten März –, rechnet

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dann 7 Tage hinzu, so findet sie den 17ten März, welches der Tag ist, an dem sie ihre Niederkunft zu erwarten hat" [5, our emphasis], which we translate as: "It is calculated starting from the day when the woman had her last period: Going back 3 complete months and then adding 7 days: The day found in this way is the due date. So if the woman had her last period on 10 June and counts 3 months backwards to 10 March and then adds 7 days, the 17 March becomes her due date". The reference to "having her menstruation" could indicate any day during the menstrual period. It is not until the seventh edition in 1847 that he fully clarifies which day he meant: "Man rechnet von dem Tage an, wo die Reinigung zum letzten Male sich eingestellt hat, 3 ganze Monate zurück und zählt dann 7 Tage hinzu; der so gefundene Tag ist alsdann derjenige, an welchem die Niederkunft zu erwarten ist. Hat bei einer Frau z. B. am 10ten Juni ihre Reinigung zum letztenmale [sic] sich eingestellt, so zählt sie 3 ganze Monate zurück – also bis zum 10ten März –, rechnet dann 7 Tage hinzu, so findet sie den 17ten März, welches der Tag ist, an dem sie ihre Niederkunft zu erwarten hat" [5, our emphasis], which we translate as: "It is calculated starting from the day when the last period began: going back 3 complete months and then adding 7 days: the day thus found date is the due date. If, for example, a woman had the beginning of her last period on 10 June going back 3 months to 10 March and adding 7 days, the 17 March becomes her due date". The German wording unequivocally refers to the first day of menstruation as the reflexive verb "sich einstellen" can only be used as a synonym for "to start/to arrive".

Discussion

Although it might appear attractive to state that possibly Boerhaave and Naegele may have been misinterpreted, and that the

original rule may have been to add seven days to the end rather than to the beginning of the last menstrual period, "which, with respect to induction of labour for post dates pregnancy, would achieve the same result as ultrasound" as Baskett and Nagele [1] assume, an analysis of the original documents does not support such a statement. Naegele, in fact, meant the first day of the last menstrual period. It now seems it is time to revise textbooks such as those of Pairman [2].

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