

When does the uterine fundus reach the umbilicus?



To the Editor: Traditional teaching has it that the gravid uterus reaches the level of the umbilicus at 20 weeks' gestation.^{1,2} However, this conventional wisdom is mostly not substantiated by studies supporting it.³ According to Nel, the lower edge of the umbilicus corresponds with 20 weeks' and the upper edge with 24 weeks' gestation.⁴ Although it might appear clinically difficult to separate these two levels, some authors claim that a 24-week pregnancy reaches the umbilicus (upper or lower edge not mentioned), giving some credence to Nel's claim.⁵ This study was carried out using abdominal palpation in women with certain dates, a regular cycle, and an empty bladder. A correlation with sonographic assessment of the gestational age (GA) would be more accurate than the menstrual history.

In view of the wide range of reported values, we investigated 314 pregnant women with a fundus determined to be at the level of the umbilicus by gentle abdominal palpation. The women were not invited to void; the condition of the bladder (empty/full) was recorded at the time a transabdominal ultrasound was done to establish the GA. In 35 cases the bladder status was not available from the notes. Four twin pregnancies were also excluded from the study. A total of 275 cases were eligible; 66 (24.0%) had a full bladder and 209 (76.0%) an empty bladder.

Fig. 1 illustrates the relative distribution by GA. If consideration is given to the fact that the sonographic estimate by GA has a standard deviation of roughly 1 week, 115 (55.0%) of the fundi at the level of the umbilicus corresponded with 20.0 ± 1.0 weeks'

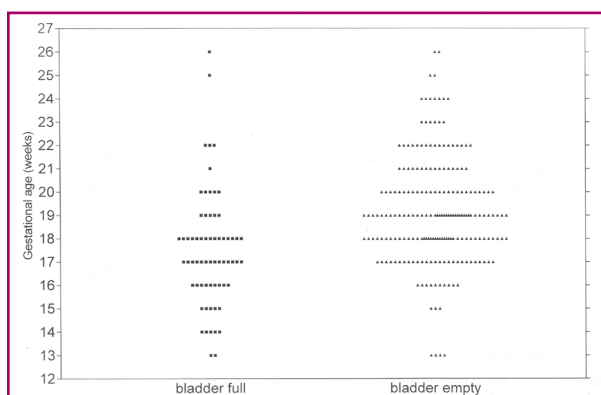


Fig. 1. Distribution by sonographic gestational age.

gestation when the bladder was empty. With a full bladder, however, only 11 (16.7%) pregnancies had reached 20 weeks' gestation (chi-square = 11.0, $p = 0.0009$, odds ratio = 0.32 (95% confidence interval: 0.16 - 0.64))

Fig. 2 shows that there was an average difference in GA of about 2 weeks depending on the fullness or emptiness of the bladder. This is in keeping with findings of an earlier study⁶ indicating that at 17 - 20 weeks the fundal height is 3 cm higher with a full bladder.

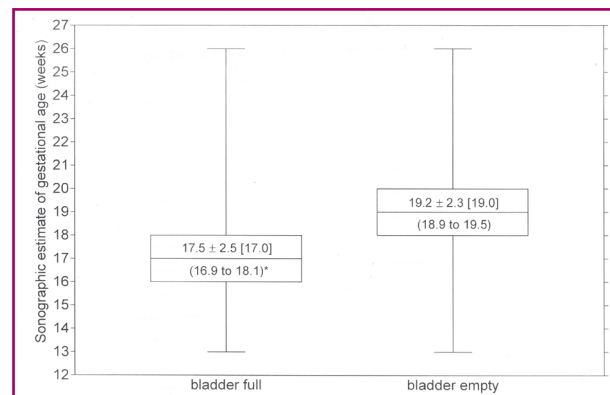


Fig. 2. Box and whiskers graph of gestational ages (*values are mean SD [median] (95% confidence interval); $t = 5.1$; $p < 0.0001$).

From the present data we conclude that provided the bladder is empty, a fundus at the umbilicus corresponds with 20 weeks' gestation in only half of the cases.

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