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ANTENATAL VOIDING FUNCTION AND POSTNATAL RETENTION.

Aims of study.

Postpartum urinary retention is largely thought to be a consequence of intrapartum or immediate postpartum factors. At risk factors include instrumental delivery, epidural block, prolonged labour, peri-urethral / perineal trauma and infrequent bladder emptying during labour. However the possibility of pre-existing voiding dysfunction or antenatal deterioration has not been excluded.

Methods.

We enrolled 114 primigravid patients with no history of voiding difficulty, neurological disease or spinal trauma. Urinary flow rate was measured (using a Dantec Etude flowmeter) on 1-3 occasions antenatally and at 10-14 weeks postpartum. Residual urine volume was calculated by transabdominal ultrasound using the formula derived for puerperal patients (height x width x depth x 0.7)(1).

Extensive delivery details were recorded including birthweight, mode of delivery, analgesia, length of first & second stage of labour and any intrapartum voiding or catheterisation. Residual urine volume was again assessed on day 2 postpartum.

Results.

Mean voided volumes and maximum flow rates did not alter significantly throughout pregnancy or postpartum. We did not find a reduction in flow rate or voided volume in the third trimester as has been reported (2,3).

Gestation	< 20 weeks	21 – 27 weeks	28 – 34 weeks	35 – 40 weeks	postpartum
Mean volume (range)	261.8 mls (19-1071)	274.3 mls (42 – 1110)	238.0 mls (46 – 800)	263.4 mls (29 – 922)	206.8 mls (25 – 608)
Mean maximum flow rate (range)	24.4 mls/sec (9 – 42)	29.2 mls/sec (9 – 60)	32.8 mls/sec (8 – 67)	29.6 mls/sec (9 – 66)	24.5 mls/sec (6 – 54)

In fact, having corrected for voided volume (using the Liverpool nomograms) (4), urinary flow rates were highest between 28-34 weeks and significantly higher than non-pregnant rates for all of third trimester ($P < 0.001$).

Antenatally there were no residual urine volumes > 100 mls. Postnatally 6 women had urinary retention on day 2 (residuals 237 – 1500 mls) and 3 of these required a suprapubic catheter for persistently high residuals. All patients were voiding normally by 3 weeks postpartum.

Numbers were too small to analyse for mode of delivery however 5 / 6 patients with retention had an instrumental delivery and both active & total second stage of labour were twice as long in the retention group. All 6 patients had an epidural block and required an episiotomy. Two patients were left 7 and 14 hours respectively without voiding but in all other cases the interval was less than 4 hours.

There was no significant difference in antenatal mean voided volume or maximum flow rate for patients with postpartum voiding dysfunction. However, patients with subsequent retention did not demonstrate the rise in third trimester flow rate ($P < 0.001$).

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Conclusions.

Clearly peripartum factors such as instrumental delivery, prolonged labour, epidural anaesthesia, bladder overdistension etc are important in the pathogenesis of postpartum urinary retention. However a previously unrecognised voiding dysfunction may present acutely postpartum. One patient had antenatal voided volumes between 650 – 1100 mls with normal flow rates. On day 2 postpartum she was asymptomatic with a residual urine volume of 1500 mls.

The absence of a third trimester increase in flow rate suggests there is also some predisposing antenatal deterioration in voiding function in those patients with subsequent retention. No patient with a maximum flow rate on or above the 75th centile at any gestation developed postpartum retention. The measurement of urine flow rate and voided volume during third trimester could be used to indicate which patients having eg an instrumental delivery may benefit from prophylactic catheterisation or at very least closer monitoring of residual urine volume.

References.

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