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THE ENIGMA: BLADDER SENSATION AFTER DELIVERY.

Hypothesis / aims of study

To compare for each mode of delivery:

- time for first bladder sensation to return
- the volume of urine present in the bladder for each mode of delivery / compare this to the total volume of urine produced
- the post residual volume (PVR) within 48 hours of delivery.

Study design, materials and methods

Patients: women with term pregnancies were included and were recruited antenatally.
Exclusion criteria:
Age < 16 years
Any contraindication to having an indwelling catheter clamped (eg: post partum haemorrhage)
Patients with indwelling catheters had their catheters clamped following delivery thus allowing their bladders to fill spontaneously. The time taken for the patients to regain their first desire to void was recorded, the volume of urine present in the bladder at this time as measured after release of the clamp or by ultrasound. The PVR was recorded within 48 hours of delivery. Patients having epidurals in this study had a patient controlled epidural anaesthesia (PCEA).

Results

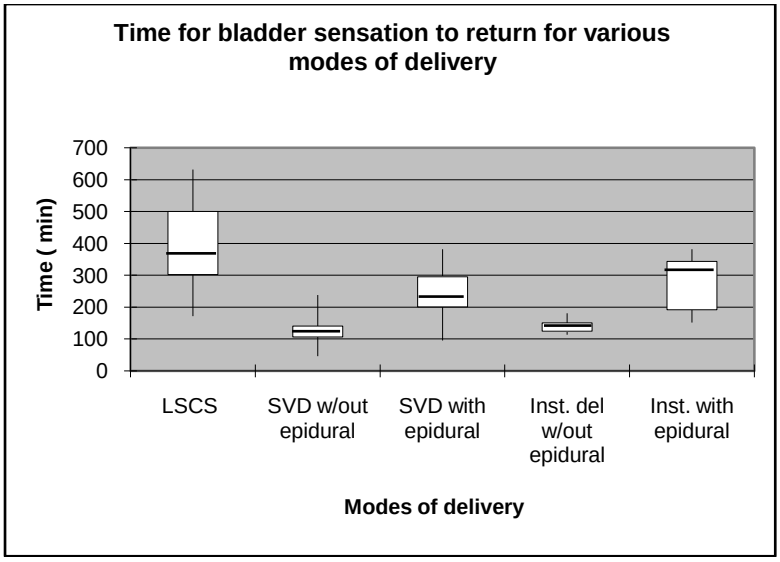
Table 1:

	Instrumental deliveries without PCEA (n= 10) Median with range	Instrumental deliveries with PCEA (n=10) Median with range	Caesarean Section with Spinal anaesthesia (n= 44) Median with range
Time for bladder sensation to return	134 min (113 min– 181 min)	278 min (151 min – 376 min)	371 min (172 min –692 min)
Vol. of urine at first sensation (mls)	202 (78- 542)	152 (74 –1011)	152.5 (56 – 518)
Total vol of urine produced at time of first sensation (mls)	202 (78- 542)	395 (150 -1011)	490 (115 – 2755)
Post void residual volume (mls)	41 (6-64)	78 (4 -165)	32 (5 – 163)
Number with residual vol. > 100mls	0	1	1

Table 2

	Vaginal deliveries with no regional anaesthesia (n= 40) Median with range	Vaginal delivery with PCEA (n= 24) Median with range
Time for bladder sensation to return (min)	120 (46 – 397)	276 (95 – 423)
Vol. of urine at first sensation (mls)	180 (42 – 631)	210 (74 – 600)
Total vol. of urine at first sensation (mls)	180 (42 – 631)	450 (150 – 1011)
Residual volume (mls)	17 (5 – 161)	16 (2 – 92)
Number with residual vol. > 100mls	1	0
Max flow rate post delivery (ml/sec)	14 (3.5 – 55.4)	17.6 (9.5 – 45)

Figure 1



Interpretation of results

A common misconception is that spinal anaesthesia last approximately 2 hours. However the study shows bladder sensation may take over 10 hrs to return following Caesarean section under spinal anaesthesia, and between 6-7 hours following vaginal deliveries with or without PCEA. The volume of urine produced before sensation returns can exceed 1 litre following epidurals and spinal anaesthesia. The use of intravenous fluids can increase the risk of bladder distension especially with a reduction of sensation. Total volume of urine produced before sensation returns following vaginal delivery can exceed 600 mls.

Conclusion

This study shows there is compelling evidence for the need of appropriate protocols for bladder management after delivery. Protocols should involve an indwelling catheter following epidurals and spinal anaesthesia for at least 6 and 11 hours respectively. In addition careful collaboration with fluid management should be considered in developing these protocols.

Specify source of funding or grant	**Birmingham Women's Health NHS Trust**
Is this a clinical trial?	**Yes**
Is this study registered in a public clinical trials registry?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Hereford and Worcester Research Ethics Committee**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**