

A STUDY ON VOIDING PATTERN IN TERM AND PRETERM NEWBORNS

Hypothesis / aims of study

How to diagnose the bladder dysfunction in newborns is challenging, not only due to the practical difficult in manipulation of the newborns, but also the normal voiding pattern in newborns is still unclear. The aim of present study was to investigate the difference of voiding patterns between term and preterm newborns.

Study design, materials and methods

A total of 26 hospitalized newborn aged 3 to 7 days at The First Affiliated Hospital of Zhengzhou University from Mar to May 2010 were included in this study. Twelve of them were term newborns (38.3±1.1 weeks of gestation) with weight (3.1±0.4) kg, another 14 preterm newborns (32.5±1.6 weeks of gestation) with weight (1.7±0.4) kg. The voided volume, post void residual (PVR) volume, state of consciousness at voiding, voiding time, voiding frequency per 12 hours, and meanwhile, the quantity of intake milk, liquid within the same time schedule for 12 hours from 9AM to 9PM were recorded. The liquid intake was given according to standards protocol. The diaper weight difference before and after voiding was defined as voided volume. The PVR volume was determined by ultrasound.

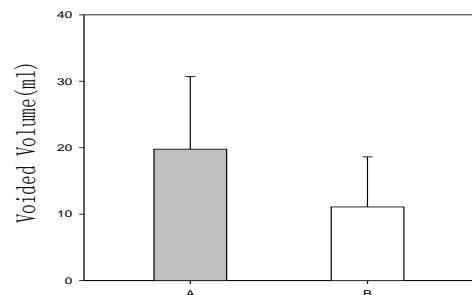
Results

Comparing term with preterm newborns, voided volume and consciousness voiding rate was significant higher [(19.8±10.9) ml vs (11.1±7.5) ml and (43.5±26.8) % vs (24.7±19.1) %], whereas PVR volume and voiding frequency were significant lower [(1.55±1.01) ml vs (1.82±0.88) ml, (7.2±1.9) times vs (9.6±2.5) times per 12 hours, respectively].

Table 1 – Comparison of voiding pattern between term and preterm newborns

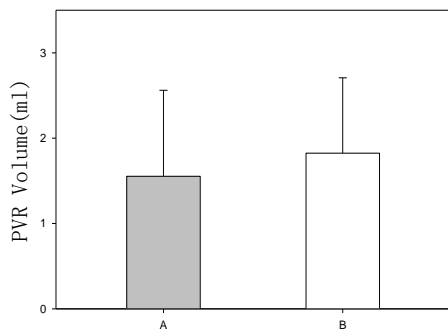
Group	Voided volume (ml)	PVR volume (ml)	Consciousness voiding rate (%)	Voiding time
Term newborn	19.8±10.9	1.55±1.01	43.5±26.8	7.2±1.9
Preterm newborn	11.1±7.5	1.82±0.88	24.7±19.1	9.6±2.5
<i>t</i> value	7.012	2.095	2.205	2.717
<i>p</i> value	<0.0001	0.0373	0.0373	0.0120

PVR = post void residual



A = term newborn; B = preterm newborn

Fig.1 – Comparison of voided volume between term and preterm newborns



A = term newborn; B = preterm newborn; PVR = post void residual
Fig.2 – Comparison of PVR between term and preterm newborns

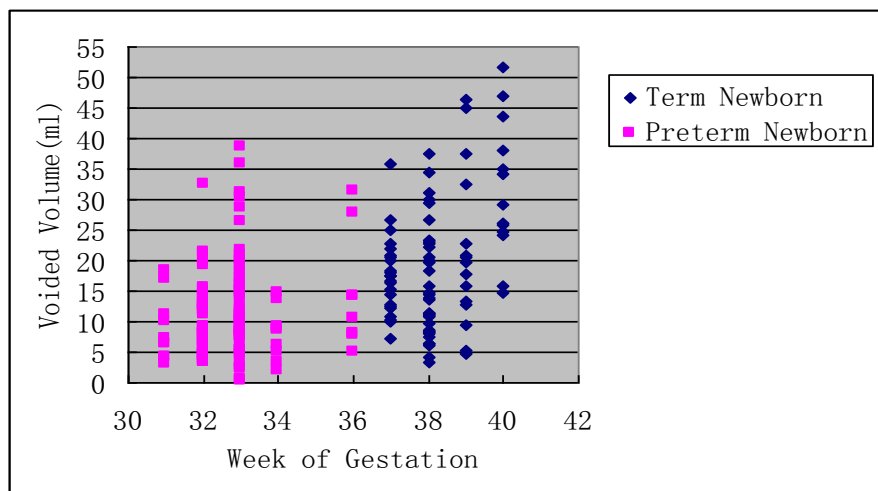


Fig.3 – The observation result of voided volume in all newborns

Interpretation of results

The difference of bladder function between term and preterm newborns is significant. The development of nerve system had a great impact on voiding.

Concluding message

Both term and preterm newborns have shown a high PVR volume indicating the incomplete voiding pattern exists in newborns. The difference of voiding patterns between term and preterm newborns evidenced the different stages of bladder function development, more maturation of bladder function in term than those of preterm newborns.

References

1. Sillen U, Solsnes E, Hellstrom AL, et al. The Voiding Pattern of healthy preterm neonates. J Urol, 2000, 163: 278-281
2. Olsen LH, Grothe I, Rawashdeh YF, et al. Urinary flow patterns in first year of life. J Urol, 2010, 183(2): 694-698.
3. Olhweiler L, da Silva AR, Rotta NT. Primitive reflex in premature healthy newborns during the first year. Arq Neuropsiquiatr, 2005, 63(2A): 294-297

Specify source of funding or grant	No
Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Ethical Committee of the First Affiliated Hospital of Zhengzhou University
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes