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Incidence and Risk Factors of Traumatic Lumbar Puncture in Newborns in a Tertiary Care Hospital

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Abstract : Background: Traumatic lumbar puncture (LP) is a common occurrence and causes substantial diagnostic ambiguity. There is paucity of data regarding its epidemiology. Objective: To assess the incidence and risk factors of traumatic LP in newborns. Design/Methods: In a prospective cohort study, all inborn neonates admitted in NICU and planned to undergo LP for a clinical indication of sepsis were included. Neonates with diagnosed intraventricular hemorrhage (IVH) of grade III and IV were excluded. The LP was done by operator - often a fellow or resident assisted by bedside nurse. The unit has policy of not routinely using any sedation/analgesia during the procedure. LP is done by 26 G and 0.5-inch-long hypodermic needle inserted in third or fourth lumbar space while the infant is in lateral position. The infants were monitored clinically and by continuous measurement of vital parameters using multipara monitor during the procedure. The occurrence of traumatic tap along with CSF parameters and other operator and assistant characteristics were recorded at the time of procedure. Traumatic tap was defined as presence of visible blood or more than 500 red blood cells on microscopic examination. Microscopic trauma was defined when CSF is not having visible blood but numerous RBCs. The institutional ethics committee approved the study protocol. A written informed consent from the parents and the health care providers involved was obtained. Neonates were followed up till discharge/death and final diagnosis was assigned along with treating team. Results: A total of 362 (21%) neonates out of 1726 born at the hospital were admitted during the study period (July 2016 to January, 2017). Among these neonates, 97 (26.7%) were suspected of sepsis. A total of 54 neonates were enrolled who met the eligibility criteria and parents consented to participate in the study. The mean (SD) birthweight was 1536 (732) grams and gestational age 32.0 (4.0) weeks. All LPs were indicated for late onset sepsis at the median (IQR) age of 12 (5-39) days. The traumatic LP occurred in 19 neonates (35.1%; 95% C.I 22.6% to 49.3%). Frank blood was observed in 7 (36.8%) and in the remaining, 12(63.1%) CSF was detected to have microscopic trauma. The preliminary risk factor analysis including birth weight, gestational age and operator/assistant and other characteristics did not demonstrate clinically relevant predictors. Conclusion: A significant number of neonates requiring lumbar puncture in our study had high incidence of traumatic tap. We were not able to identify modifiable risk factors. There is a need to understand the reasons and further reduce this issue for improving management in NICUs.

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