Healthcare Innovations
How practice has changed

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Nurses' impressions of a micro-sampling technique for neonatal blood collection

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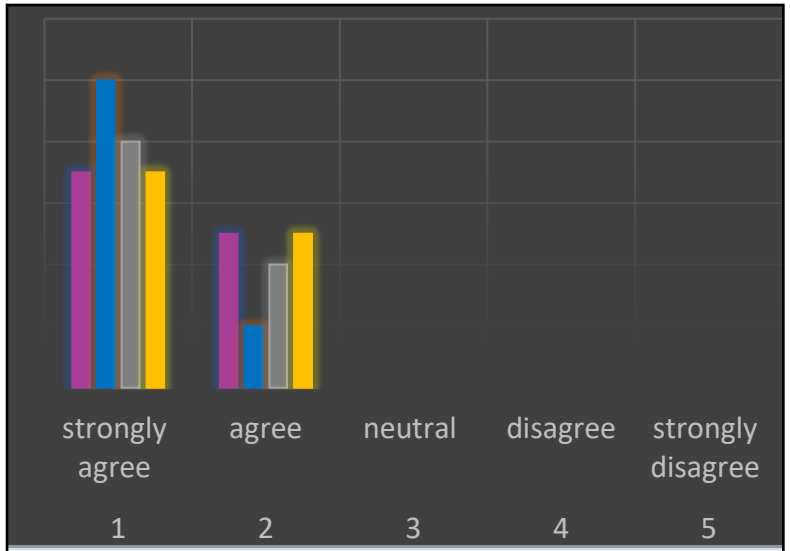
Purpose: Blood sampling from neonates can cause discomfort and distress, for both baby and family.[1] Currently bedside nurses collect 0.5-2.5 mL of blood using either venipuncture or capillary-lance heel-prick for serum gentamicin levels. Newer sampling techniques requiring less than 0.5 ml might be effective and less painful for neonates.[2,3,4] ***This study assessed nurses' perceptions (education, use and pain) of volumetric absorptive microsampling devices (VAMS) compared to standard care.***



Key: ■ Adequate training provided, ■ Confidence using VAMS, ■ Recommend VAMS, ■ VAMS less invasive than standard care

Figure 1: Training, confidence, invasiveness and recommendation of VAMS

Methods: A paper based survey was distributed to neonatal nurses who had used VAMS for gentamicin levels as part of the OPTIONS study (compared concurrent sampling using two VAMS samples of 0.02 mL of blood and standard collection for gentamicin levels). HREC approval was obtained, with consent from participating nurses. Descriptive statistics were used and analysis completed in Excel.

Results: A total of 20 surveys were provided to nurses who participated in OPTIONS between June and December 2020. Surveys were returned from 12 nurses for a total response rate of 60%. Nurses strongly agreed 58% (n=7) or agreed 42% (n=5) that adequate education was provided for the technique; and they were similarly confident using the VAMS sampling, strongly agreed 83% (n=10) or agreed 17% (n=2) (Figure 1). All of the nurses who responded would recommend the VAMS sampling and found it less invasive compare to standard care 100% (n=12). When asked about their perception of the VAMS sampling for the neonate, 33% (n=4) of nurses reported that pain was observed, 15% (n=2) were neutral and 50% (n=6) disagreed that pain was experienced (Figure 2).

Conclusions: All 12 nurses agreed that they had been well trained in, and were confident in using VAMS. Half the respondents observed that the infant felt no pain, which may be related to surveys responses based on recollection rather than direct observation at the time of collection. All nurses responding felt that VAMS was less invasive and would recommend it as a method of blood collection. This sampling technique appears promising and is likely to be less discomforting and distressful for babies and their families.

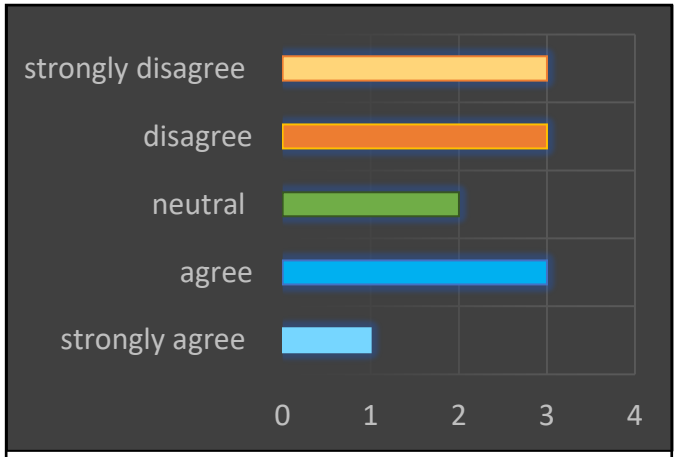


Figure 2: Pain during VAMS sampling

References: **1-**Bueno M, Nishi ET, Costa T, Freire LM, Harrison D. Blood Sampling in Newborns: A Systematic Review of YouTube Videos. *The Journal of perinatal & neonatal nursing.* Apr/Jun 2017;31(2):160-165. doi: 10.1097/JPN.0000000000000254. **2-** Parker SL, Dorofaeff T, Lipman J, et al. Is there a role for microsampling in antibiotic pharmacokinetic studies? *Expert Opin Drug Metab Toxicol.* Jun 2016;12(6):601-614. doi: 10.1080/17425255.2016.1178238. **3-** Scuderi CE, Parker SL, Jacks M, et al. Kidney transplant recipient's perceptions of blood testing through microsampling and venepuncture. *Bioanalysis.* 2020;12(13):873-881. **4-**Guerra Valero Y, Dorofaeff T, Parker L, et al. Microsampling to support pharmacokinetic clinical studies in pediatrics. *Pediatr Res.* May 22 2021. doi: 10.1038/s41390-021-01586-4.

Image 1-3:
1- Demonstration VAMS sample for adult,
2-Location of sample for newborn heel,
3- Complete VAMS sample