

Urinary tract infection screening in babies with prolonged jaundice: can a change in urine bottle contribute to improvement in quality of clinical practice?

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Objectives

An observation of a high positive urine culture was made among babies with prolonged jaundice and its negative impact on clinical practice, workload, and increasing anxiety among mothers. Discussions were initiated with microbiologists and information given was that the preferred bottles for urine samples were boric acid bottles because they prevented overgrowth of contaminants.(1) It was hypothesized that the use of plain bottles for urine samples might be partly responsible for the observed high positive urine culture rate among babies with prolonged jaundice. The project set out to compare prevalence and management pathway of babies with positive urine cultures before and after introducing boric acid bottles.

Methods

This was a quality improvement project. A six-month data was audited from the prolonged jaundice clinic through a period when plain bottles were being used for urine sample transportation to the laboratory. Boric acid bottles were then introduced for the purpose of urine sample collection in the same clinic and a 3-month adjustment period was given before re-auditing 5-month data of the same category of babies. Statistical analysis was done using SPSS version 20 with frequencies for univariate analysis and chi square to compare groups.



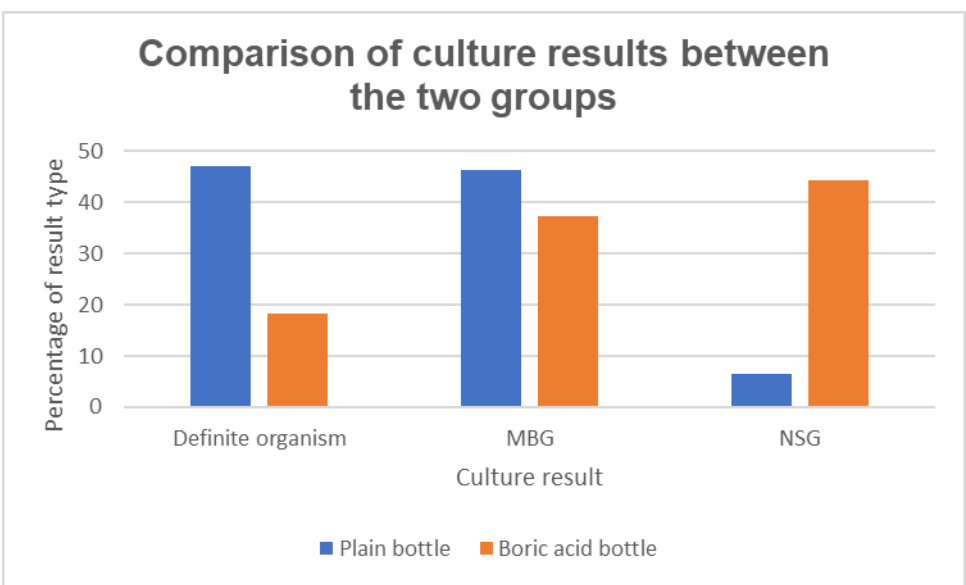
Plain Bottle



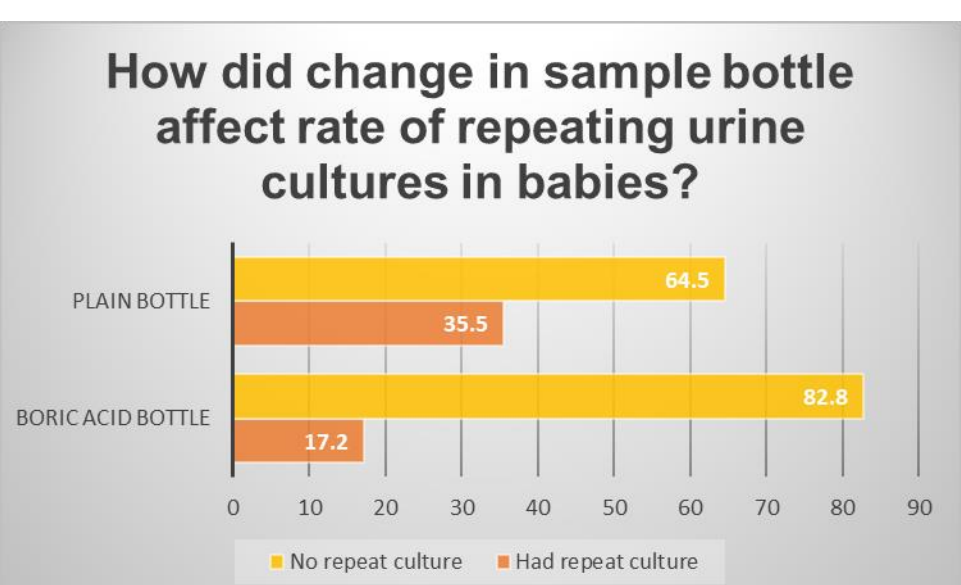
Boric acid Bottle

Results

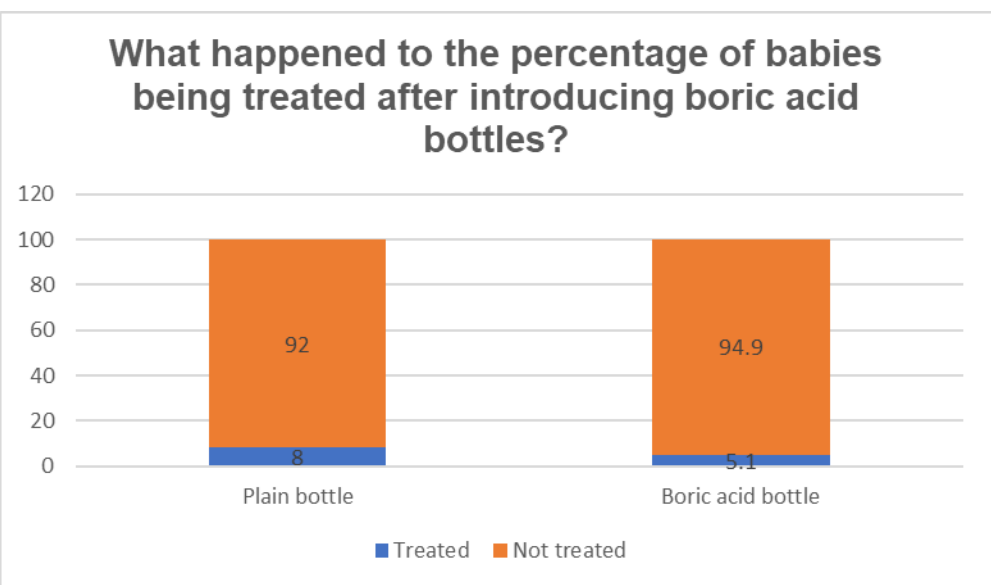
The record of 149 babies were reviewed for the six months when plain bottles were still being used and urine culture was available for 138 (92.6%) of these babies. Similarly, 99 out of 107 (92.5%) babies whose data were reviewed after introduction of boric acid bottles, had urine culture. Change in sample collection bottle from plain bottle to boric acid bottle significantly reduced the rate of definite bacterial growth in urine cultures and the need for repeated cultures. Though there was a reduced need to treat babies for urinary tract infection once boric acid bottles were introduced compared with when plain bottles were still being used, this difference was not statistically significant. While more females than males had at least one organism identified in their cultures during both phases of data collection, a statistically significant difference in the sex distribution was only observed with the introduction of boric acid bottle.



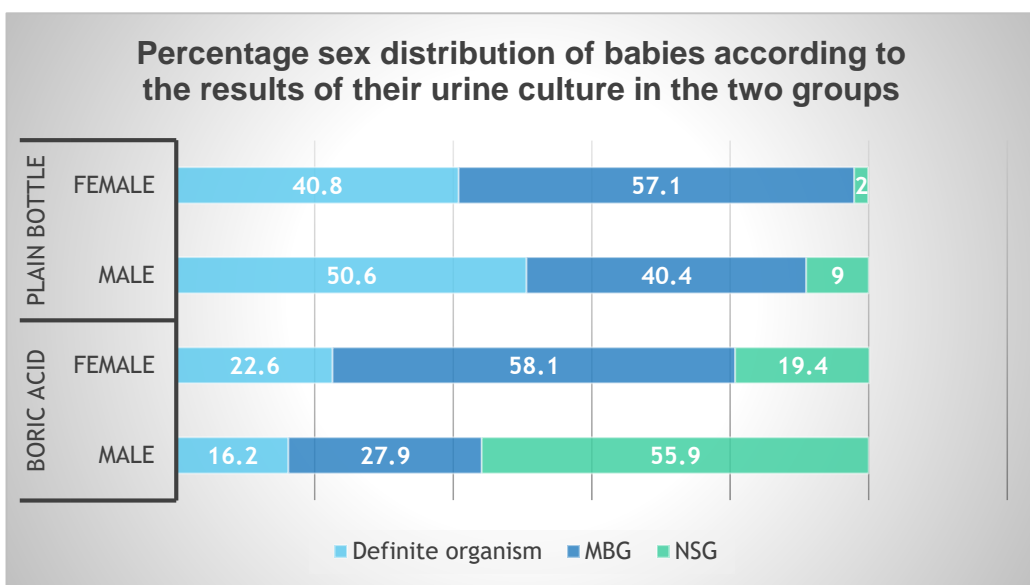
$\chi^2 = 51.934$ $p = 0.000$



$\chi^2 = 9.645$ $p = 0.002$



$\chi^2 = 0.781$ $p = 0.377$



Plain bottle: $\chi^2 = 4.875$ $p = 0.87$
Boric acid bottle: $\chi^2 = 12.042$ $p = 0.002$

MBG: mixed bacterial growth
NSG: no significant growth

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Conclusions

There was a high rate of positive urine culture among babies with prolonged jaundice with a significant reduction in this trend with the introduction of boric acid bottles. The gender distribution of babies in the two groups is in contrast to the norm for this age group.(2) a trend suggesting that many of the organisms cultured were contaminants. It is not surprising that positive cultures became more significantly predominant among females, who are more likely to have heavier urine contamination, once boric acid bottles were introduced. This project has helped to reduce rate of performing unnecessary urine cultures within the unit, impacting on reduction of cost and parental anxiety waiting for the results of the urine cultures of their babies. Invariably, there will be reduced burden of workload on the nurses involved in sample collection, the laboratory scientists processing the samples and the doctors interpreting the results and taking decisions as to the necessity of treatment.

References

References
1. Pathology services handbook by East Sussex Healthcare NHS Trust, I Diton, Aug 2022.
2. Urinary tract infections in the infant, M Arshad, PC Seed, Clin Perinatol Mar 2015; 42(1)

Audio link for more explanation:
<https://on.soundcloud.com/bNXFu>