

...assess the effectiveness of antibiotic lock versus no antibiotic lock or alternative antibiotic lock in the prevention of catheter-related infections in newborn infants of any gestational age during their initial stay in the neonatal unit and to study any relevant adverse effects from antibiotic lock therapy” Taylor et al (2015).

Reference:

Taylor, J.E., Tan, K., Lai, N.M. and McDonald, S.J. (2015) Antibiotic lock for the prevention of catheter-related infection in neonates. The Cochrane Database of Systematic Reviews. CD010336. .

Antibiotic lock for the prevention of catheter-related infection in neonates

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Abstract:

**BACKGROUND:** Use of a central venous catheter (CVC) in neonates is associated with an increase in nosocomial infection. Numerous strategies exist to prevent catheter-related bloodstream infection (CRBSI); however, CRBSI continues to be a major problem. Antibiotic locking catheters is a new and promising treatment that potentially prevents this severe condition.

**OBJECTIVES:** To assess the effectiveness of antibiotic lock versus no antibiotic lock or alternative antibiotic lock in the prevention of catheter-related infections in newborn infants of any gestational age during their initial stay in the neonatal unit and to study any relevant adverse effects from antibiotic lock therapy.

**SEARCH METHODS:** Methods followed those of the Cochrane Neonatal Review Group (CNRG). We searched the Cochrane Central Register of Controlled Trials (The Cochrane Library 2014, Issue 5); MEDLINE (via PubMed); EMBASE (hosted by EBCHOST); CINAHL; abstracts from Pediatric Academic Societies, European Society for Paediatric Research and trials registries; and references cited in our short listed articles using keywords and MeSH headings, up to April 2015.

**SELECTION CRITERIA:** We considered all trials utilising random or quasi-random participant

allocation. Participants included all newborn infants of any postmenstrual age who required any type of CVC. We compared an antibiotic lock technique with no antibiotic lock or placebo, such as heparinised saline, for any duration of time.

**DATA COLLECTION AND ANALYSIS:** We extracted data using the standard methods of the CNRG. Two review authors independently assessed the relevance and risk of bias of the retrieved records. We expressed our dichotomous results using risk ratio (RR) with their 95% confidence intervals (CIs). We assessed for heterogeneity using the I<sup>2</sup> statistic.

**MAIN RESULTS:** We included three trials (271 infants) in this review. Two of the three included studies had an overall low risk of bias and the remaining study had high risk of selection and performance biases. The use of an antibiotic lock decreased the incidence of confirmed catheter-related infection (typical RR 0.15, 95% CI 0.06 to 0.40; 3 studies, 271 infants) (high-quality evidence). The typical absolute risk reduction (ARR) was 18.5% and the number needed to treat for an additional beneficial outcome (NNTB) was 5. The effect of use of an antibiotic lock on suspected catheter infection was imprecise (typical RR 0.65, 95% CI 0.22 to 1.92) (moderate quality evidence). Confirmed and suspect infection rates combined were lower in the antibiotic lock group (absolute rates, RR 0.25, 95% CI 0.12 to 0.49; rate per 1000 catheter days, RR 0.17, 95% CI 0.07 to 0.40). The ARR was 20.5% and the NNTB was 5. None of the studies report resistance to the antibiotic used during the lock treatment. There was no significant difference in the detectable serum levels of antibiotic. When the data from two studies were pooled, there were significantly fewer episodes of hypoglycaemia in the treatment arm (typical RR 0.51, 95% CI 0.28 to 0.92). There was no statistically significant difference for mortality due to sepsis between the control and intervention group.

**AUTHORS' CONCLUSIONS:** Based on a small number of trials and neonates, antibiotic lock solution appeared to be effective in preventing CRBSI in the neonatal population. However, as each included study used a different antibiotics and antibiotic resistance could not be reliably assessed, the evidence to-date is insufficient to determine the effects of antibiotic lock on infections in neonates.

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