



COMMENT

Cochrane corner: interventions for preventing ophthalmia neonatorum

Aesha N. J. Malik¹✉ and Clare Gilbert¹

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Ophthalmia neonatorum, which is defined as conjunctivitis within the first 28 days of life, can be caused by a variety of organisms. Transmission rates of gonococcal infection from mother to newborn are ~30–50%. Ophthalmia neonatorum due to *Neisseria gonococcus* has the most severe consequences and untreated can lead to corneal perforation and vision loss in 24 h, as reported in Kenya where up to 16% of affected infants had cornea involvement at presentation [1]. Chlamydial ophthalmia neonatorum is more prevalent than gonococcal but has been underdiagnosed due to lack of accurate diagnostic facilities. Untreated chlamydial ophthalmia neonatorum also has a high risk of corneal and conjunctival scarring which can lead to visual loss. Other causes of ophthalmia neonatorum include haemophilus, streptococcus, staphylococcus and pseudomonas species as well as adenovirus and herpes simplex virus. In the late 1800s the first ocular prophylaxis was introduced which entailed cleaning the eyelids shortly after birth with instillation of topical silver nitrate solution (Crede's prophylaxis). This remained in place until antibiotics such as erythromycin and tetracycline, and more recently, the antiseptic povidine iodine, became available which do not cause chemical conjunctivitis. However, evidence of which agent is the most effective is lacking.

The prevalence of ophthalmia neonatorum and the causative organisms vary in different parts of the world. Overall, it has become rare in high-income countries (HICs) mainly due to increased knowledge about STDs and better treatment, higher standards of maternal healthcare, and ocular prophylaxis at birth. The USA continues to recommend universal ocular prophylaxis based on the relatively high prevalence of gonococcal infection in the general population, and many other countries have also continued with prophylaxis. Globally the prevalence of STDs remains high with one million incident cases (2012), with 91% of these infections being in low- and middle-income countries (LMICs) [2]. The prevalence of STDs during pregnancy also vary: *Neisseria gonococcus* ranges from 1.2% in Latin America to 4.6% in Southern Africa, and *Chlamydia trachomatis* from 0.8% in Asia to 11.2% in Latin America [3, 4]. There is, therefore, a stronger case for universal ocular prophylaxis in LMICs particularly where facilities for antenatal screening for gonococcal infection are likely to be inadequate.

In the recently published Cochrane Review of 'Interventions for preventing ophthalmia neonatorum' the authors aimed to determine if any type of systemic or topical eye medication is better than placebo or no prophylaxis in preventing ophthalmia

neonatorum, and if any one medication is better than another [5]. The review included 30 trials with a total of 79,198 neonates; 12 of which were undertaken in LMICs. This diverse group of trials spanned a very long time period with seven trials between 1940 and 1960 and 11 between 2000 and October 2019. There was also a wide range of prophylactic interventions with 14 different prophylactic regimens involving 12 different prophylactic agents.

There were no data on whether prophylaxis for ophthalmia neonatorum prevents serious outcomes such as blindness or other adverse visual outcomes. All the studies were judged to be at high risk of bias in at least one domain and half were quasi randomized. Overall, the authors found moderate-certainty evidence that the use of prophylaxis may lead to a reduction in the incidence of conjunctivitis from any cause, but that the evidence for a specific effect on gonococcal, chlamydial or bacterial conjunctivitis was of low- to very low-certainty. The comparison of different intervention regimens did not suggest any superior intervention but the evidence was all low-certainty and the data limited.

The World Health Organization (WHO) continues to recommend universal topical ocular prophylaxis to prevent ophthalmia neonatorum [6, 7]. WHO recommends tetracycline hydrochloride 1% eye ointment, erythromycin 0.5% eye ointment, povidone iodine 2.5% solution, silver nitrate 1% solution or chloramphenicol 1% eye ointment. However, the WHO/IAPB report on Preventing Blindness in Children recommended a 2.5% aqueous solution of povidone iodine [8]. As suggested by the Cochrane Review authors, a trial comparing povidone iodine, chloramphenicol and tetracycline would potentially lead to more universally applicable prophylaxis for ophthalmia neonatorum. However, trials in this area are challenging both epidemiologically and logistically due to the need for large sample sizes, and difficulties in obtaining good follow up rates in high risk populations. Overall, the evidence suggests a policy of continuing prophylaxis in LMICs or where there is high risk of untreated maternal STDs, particularly gonococcal infection. Which prophylactic agent to use would ideally be guided by antibiotic resistance of the main causes of ophthalmia neonatorum locally, as recommended by WHO.

It is essential that the preventive measures for ophthalmia neonatorum are included in routine maternal, newborn and child health programmes for them to be universally adopted. Ensuring implementation requires that it is taught to staff providing services for pregnant women and newborns who may not be aware of the benefits and therefore not routinely practice prophylaxis despite recommendations [9]. Appropriate prophylactic agents need to be

¹International Centre of Eye Health, Department of Clinical Research, London School of Hygiene & Tropical Medicine, London WC1V 7HT, UK. ✉email: aesha.malik@lshtm.ac.uk

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on the essential drugs lists and available where needed. Despite the limited evidence, ophthalmia neonatorum prophylaxis remains an important part of the strategy to reduce or eliminate ophthalmia neonatorum and its blinding consequences.

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AUTHOR CONTRIBUTIONS

ANJM wrote the commentary, CG reviewed and commented on the commentary.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to Aesha N. J. Malik.

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