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SHORT COMMUNICATION

Prospective assessment of systemic side effects of topical ophthalmic drug administration for screening for retinopathy of prematurity

Leen Willems[1], Karel Allegaert[1], Ingele Casteels[2]

[1]*Department of Paediatrics, Division of Woman and Child, University Hospital, Leuven, Belgium*

[2]*Department of Ophthalmology, University Hospital, Leuven, Belgium*

Corresponding author

Karel Allegaert, NICU, Department of Paediatrics, University Hospital, Gasthuisberg, Herestraat 49, 3000 Leuven, Belgium.
Email: karel.allegaert@uz.kuleuven.ac.be

The effects of topical ophthalmic dilatation with tropicamide 0.5% and phenylephrine 2.5% were assessed in 42 neonates undergoing ophthalmoscopic screening for prematurity. No adverse effects on heart rate, blood pressure or pain scores were noted.

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Based on the review recently published in this journal on systemic toxicity with topical ophthalmic medications in children, we would like to report on our observations on the impact of topical ophthalmic drug administration during screening for retinopathy of prematurity (ROP)[1]. These observations were prospectively collected as part of a broader study on the assessment of the stress response during and following ROP screening in preterm neonates[2].

Ophthalmoscopic screening for retinopathy of prematurity in the Gasthuisberg Neonatal Intensive Care Unit (NICU) is performed by indirect ophthalmoscopy using a 20 diopter lens and a small Fabrilens as designed by Missotten to keep the eyelids open[3]. Ophthalmoscopy is performed without local or systemic anaesthetics or analgesics, but pharmacological dilatation (tropicamide 0.5% and phenylephrine 2.5%) is administered one hour before examination in both eyes by a nurse with specific expertise in neonatal care. In line with international guidelines on screening for retinopathy of prematurity, infants with a gestational age below 32 weeks are screened and screening is initiated at the postnatal age of 4 to 5 weeks. Further screening depends on findings at first examination[2,4].

A prospective observational study was conducted in the NICU following approval by the local ethical board of the University Hospital Gasthuisberg, Leuven, Belgium and parents were informed of the study.

Clinical information, vital signs (heart rate, mean blood pressure, saturation) and CRIES score were recorded before, and 10, 30 and 60 min after administration of the eye drops. Vital signs

(heart rate, blood pressure, oxygen saturation) and CRIES score were recorded 5, 10, 15, 30, 60 min and 3, 6 and 12 h after the ophthalmoscopic examination. Each infant was only included once. Outcome variables (CRIES score, vital signs) before and after ophthalmoscopy were compared using a paired analysis (Wilcoxon's and McNemar's test).

Clinical characteristics of 42 neonates in whom the stress response was evaluated are presented in Table 1. The administration of eye drops was not associated with any significant effect on heart rate, mean arterial pressure or CRIES score. Following eye examination, median mean arterial blood pressure (47 versus 46 mmHg), heart rate (158 versus 154/min) and CRIES score (0 versus 0) normalised within 5 min with no additional differences during further evaluation up to 12 h after the procedure.

We therefore conclude that the administration of topical ophthalmic dilatatory drugs (tropicamide 0.5% and phenylephrine 2.5%) one hour before ROP screening examination was not associated with any measurable effect on vital signs or signs of discomfort in a prospective study on 42 procedures in 42 preterm neonates. At present, we still need to assess the relevance of the technique during ROP screening on the clinical stress response using the same methodology as described by Belda et al.[5]. In contrast to this group, we have no prospective data on the gastrointestinal side effects (gastric retention, paralytic ileus) of the administration of topical ophthalmic drugs and neither can we provide the reader with prospective observations on the urine output before and after ROP screening[1,5].

Although the present observations might be reassuring, we still agree with Gray that great care needs to be taken in local application of ocular drugs and that premature neonates during screening for ROP are a population at increased risk to display systemic unintended effects.

Table 1 Clinical characteristics in 42 neonates in whom the stress response during screening for retinopathy of prematurity was evaluated, reported by median and range or number

Neonatal characteristics	
Gestational age (w)	29 (24–33)
Birth weight (g)	1140 (460–2100)
CRIB score	2 (0–9)
Characteristics at inclusion	
Postmenstrual age (w)	34 (28–40)
Weight (g)	1607 (775–2445)
Postnatal age (days)	31 (22–73)
Haemoglobin (g/dl)	11.1 (9–18)
Ventilated	4
Respiratory support	10
Supplemental oxygen	13
Caffeine treatment	23
Associated CNS abnormalities	4
Sedatives <24 h before retinal screening	3

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