This systematic review was undertaken to identify the spectrum of non-vitreoretinal ocular injuries due to child abuse. To date there have been no published systematic reviews of non-vitreoretinal ocular injuries in child maltreatment. Safeguarding of children remains the responsibility of all clinicians, with mandatory reporting of suspected maltreatment in many countries worldwide.

Method

The inclusion criteria was children aged 0-18 years experiencing non-vitreoretinal ocular injury due to physical abuse or fabricated illness, with adequate confirmation of the cause of injury and details of the injuries sustained. An all language literature search was conducted across the databases MEDLINE, PsychINFO, EMBASE, AMED, Web of Science and CNANI, for the period 1950 to January 2015. The search strategy was developed in Ovid Medline, and adapted for the remaining databases. The strategy used four sets of key words and MESH headings relating to childhood, child maltreatment, injuries and ocular terminology.

We therefore incorporated that studies had a confirmed abusive aetiology. We therefore adopted a ranking of maltreatment as pre-existing published standards and included ranks 1 and 2 only. The misdiagnosis of ocular complaints and missed clinical findings by non-ophthalmologists is well reported. The ranking of ocular examination was thus applied to ensure that the included articles met the expected standard of clinical examination. We excluded all publications where the children had not been examined by an ophthalmologist, rank 1, or a healthcare worker that performed regular ocular examinations, rank 2.

Results

1492 studies were initially identified and 152 full texts were assessed. 49 underwent two independent reviews and five met the inclusion criteria. There were three case series and two case reports. The principle reason for exclusion was the absence of a non-vitreoretinal ocular injury. Included are 26 children, 14 male and 12 female. The mean age was 36.0 months, range 1.0 to 168.0 months. Confirmation of maltreatment was Rank 1 for 13 children, and Rank 2 for 13. All children had under rank 1 ophthalmic examination. We analysed the results according to three categories and are summarised in the table below.

We have summarised the results into three categories.

1. Data set: Ocular injury as a consequence of physical abuse

This comprises three articles by DeLiddeler et al.,26 Spitzer et al.,27 and Skarbek-Borowska et al.,28 publishing on a total of 18 cases of ocular injury in child abuse. DeLiddeler and Spitzer’s cases are limited to subconjunctival haemorrhages as the presenting sign of abuse and therefore were not included.

Skarbek-Borowska presents globe ruptures with associated anterior segment signs. All of the cases were found to have subconjunctival haemorrhage of one or both eyes as a presenting sign of physical maltreatment. It is also notable that 22% (4/18) of cases had been seen in the preceding weeks with an ocular complaint and discharged, without maltreatment being recognised.

2. Data set: Ocular injury as a result of fabricated or induced illness (FII)

Data set 2 comprises of a single article by Baskin et al. and details a 5.0-month-old female infant with a fabricated ocular illness. Of particular note only on the 5th presentation was a diagnosis of maltreatment made.

3. Data set: Ocular injury as a result of corporal punishment

Calzada et al.,1 present a case series of children who developed traumatic hyphaema following corporal punishment with a belt. A total of seven children are included with an age range of 4.0 to 14.0 years. These children are significantly older than those in Data sets 1 and 2. All had hyphaema and there were frequently associated ocular and extra-ocular clinical findings. A large proportion were left with significantly impaired vision. No child underwent imaging for occult skeletal or neurological injury.

Discussion

This review applied strict inclusion standards for both the ophthalmic examination and confidence in maltreatment diagnosis. This reflects the rigorous standards expected today both internationally and locally. The lack of comparative literature addressing this topic precluded a meta-analysis, therefore we conducted a narrative synthesis on all data published of non-retinal ocular injury in cases of confirmed child maltreatment. The included 26 cases describe a wide variety of ocular, facial and skeletal injuries occurring as a consequence of child maltreatment.

It is of interest that all the children that had suffered physical abuse (Data set 1) had subconjunctival haemorrhages. The extensive list of aetologies presenting with subconjunctival haemorrhages in childhood is well reported.29 However, in the absence of these aetologies a non-accidental injury must be considered. The review raises the possibility of subconjunctival haemorrhages as a ‘sentinel injury’ in child maltreatment. It was observed that prior to the diagnosis of non-accidental injury a notable proportion had been seen with an ocular complaint and the maltreatment missed. This is in line with published estimates that almost a third of children presenting with physical abuse fail to be identified at their initial presentation.

The systematic review demonstrated that FII and corporal punishment may present with an ocular complaint and found those who suffered corporal punishment resulting in ocular injury were considerably older children (mean and median 96 months).

Only three cases (11.5%) from the included publications were found to have concurrent vitreoretinal pathology.

Summary

• Confirmation of the wide spectrum of non-vitreoretinal ocular injuries seen in child abuse or fabricated illness, particularly amongst young children.

• 75% of included cases occurred in children less than 4 years of age.

• Unexplained subconjunctival haemorrhages may be a potential sentinel injury of maltreatment and warrant careful evaluation.

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