**Supplementary Table 1.** Summary of literature on methodology for assessing the natural history of retinal haemorrhages in infants and children.

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| Author/Paper | Aim | Patients and Method | Results | Conclusion |
| **Pierre-Kahn** V et al; Ophthalmology 2003; 110:1718-1723.1 | To determine the ophthalmological manifestations and their natural course in child abuse victims. Prospective, comparative, observational case series. | 241 consecutive infants with subdural haemorrhage (SDH), <3years, but 10 excluded from the study.186 presumed shaken (Group 1); 38 had signs of direct head trauma without relevant history of trauma (Group 2); 7 proven accidental head trauma (Group 3).Binocular indirect ophthalmoscopy. Description of the fundus was drawn. | No difference in the shape, laterality and size of intraocular haemorrhages (IOHs), but significantly more frequent in Group 1 than Group 2, 77.5% vs. 20%. None of Group 3 had IOHs. 82% of the IOHs resolved within 4 weeks. | 135/153 (88.2%) IOHs disappeared between days 16 and 30. Eight fundi became normal before day 15 (in one, IOH cleared within 3 days) whereas 10 fundi showed persisting IOHs after 1 month. Blood disappeared faster when it was a small amount and superficial within the retina. When IOH were a large amount of retrohyaloid or intravitreal blood, it often took more than 1.5 months to disappear, and the patient was at risk of amblyopia. Persistent intravitreal haemorrhage required vitrectomy in two cases. |
| **Adams** GGW et al; BJO 2013. 97: (9), 1138-1142.2 | Appearance and location of RHs in critically ill children not due to birth or Abusive Head Trauma (AHT). | Prospective, emergency admissions to PICU over 6 weeks of age. Excluded: eye injuries or AHT.RetCam used by either Intensive Care staff or an Ophthalmologist. Patients recruited within first 48 hours of admission.Retinal Zone described using the international classification of retinopathy of prematurity system. | Dilated fundoscopy by paediatric ophthalmologist, or RetCam. Retinal Haemorrhages (RHs) found in 24/159 (15%) patients. 50% bilateral. Severity mild or moderate (<5-20RHs) in 75%. Location: Zone 1 45.8%.Schisis and perimacular folds in 2 patients and bilateral retinal detachment in 1 patient. |  |
| **Bhardwaj** G et al. 2014 AAPOS; 18:523-528. 3 | Grading system for describing RHs in AHT | A Traumatic Haemorrhagic Retinopathy (THR) grading system was developed, based on extent (posterior pole or periphery), spread (mild -<10, moderate >10, severe > more than half of involved regions covered by RHs, and morphology (intraretinal or extraretinal). 2 Graders. THR grades from RetCam on 38 eyes, 19 patients age <3 years with RHs associated with AHT. Graded on 2 occasions. Intra and Inter-reliability measured. | High level Intra-observer agreement across both assessments (97% and 100%). Intra-class correlation showed very high level of agreement. | The Grading system demonstrated excellent intra-observer and inter-observer reliability. |
| **Binenbaum** G et al. 2016 J AAPOS; 20:131-135. 4 | To identify the natural history of RHs in paediatric head injury, and identify patterns suggestive of chronicity in order to help establish timing of suspected traumatic injury. | 52 children <2years, head trauma abusive in 45 and accidental in 7. Cases with RHs present on initial examination with one or more follow-up examinations were retrospectively reviewed. The types and severity of RH were recorded. Numerical categories were mild 0-10, moderate 10-20, severe >20 RHs, too numerous to count (TNTC).Indirect Ophthalmoscopy was performed by a paediatric ophthalmologist.Data was extracted from clinical notes for types, severity, +/- other ocular findings. Subretinal haemorrhage was inconsistently reported.After the initial examination, re-examination was performed at 1,2,3,4,6 weeks, and then at 2,3,4months approximately. | Studied 91 eyes of 52 children. All 91 eyes had intraretinal haemorrhages (IRHs), 62/91 eyes with TNTC.In all but 1 eye, IRH resolved to none or mild within 1-2 weeks. TNTC IRH did not persist beyond a few days.The longest an isolated IRH persisted was 32 days.PRH was present in 68 (75%) eyes persisting 5-111 days.On initial examination 25% had only IRH. 75% had PRH and IRH. No eyes had only PRH.At 2 weeks, 3% had only IRH; 18% had both IRH and PRH and 45% had only PRH. In no eyes did RH worsen. | TNTC IRHs were present only on initial examination and were not seen at any subsequent examination in any children.IRH clears rapidly, whereas PRH may persist for many weeks.The presence of TNTC IRHs indicates that trauma occurred within a few days prior to examination, whereas the presence of PRH with no or few IRHs suggests days to weeks since trauma. |
| **Cowley** LA et al 2015. Pediatrics 136 (2);290-298. 5 | Validation of prediction tool for AHT | Children <36 months, Abusive or non-abusive. Details of 6 influential features estimated the likelihood. (RH, rib and long bone fracture, apnoea, seizures, and head or neck bruising) in a child with an intracranial injury. | 133 non-AHT and 65 AHT cases.95% children were less than <24 monthsWhen => 3 features in a child less than 36 months with intracranial injury, the estimated probability of AHT was 81.5%. Sensitivity of the tool 72.3%; specificity 85.7% and AUC 0.88  |  |
| **Hughes** LA et al 2006. JAAPOS; 10:102-106.6 | Birth related RHs: incidence, distribution and duration. | Prospective study. Infants recruited after birth, examined by indirect Ophthalmoscopy on Day 1 (range 1-4 days). If positive, photographed using RetCam 120o. These positive cases were re-examined between 3 and 9 days, then weekly until resolution, with RetCam if possible. | Data on 53 neonates. All RHs were intraretinal, and in all but 2 infants, RHs had resolved by 16 days (in 2 they were present at 31 and 58 days, and these were delivered by vacuum extraction).All extensive confluent haemorrhages had resolved by 9 to 17 days. Those seen in the first few days were numerous and often 1 disk diameter or larger. | RetCam provides good documentation of natural history. |
| **Longmuir SQ** et al. 2014 JAAPOS: 18(6) 529-533. 7 | Quantitative measurement of RH in suspected child abuse. Retrospective 11 year study reviewing retinal photography | Haemorrhage-covered percentage of central retinal (posterior pole of 40o centred on the fovea), in relation to: death, duration of hospital stay, abnormal findings on neuroimaging or skeletal survey, and definite vs. possible abuse. Image analysis. The investigator was masked. Image J software was used. The boundary of each haemorrhage was traced, within a 40o circle centred fovea, or circle centred on fovea with a diameter of 8 optic-discs. Total surface area of haemorrhage was recorded and the haemorrhage-covered fraction calculated. | Significant difference in the RH measurements in patients with axial skeletal fracture, signs of brain trauma on neuroimaging, and definite vs. possible abuse. | This measurement correlated with some features of abuse. |
| **Takashima** Y et al 2016. J Ophthalmology. 2016. 8 | Quantifying the size of RH in eyes with retinal venous occlusion. | 35 fundus photographs from 35 consecutive eyes with Branch Retinal Vein Occlusion were studied. Images were analysed with PowerPoint software and a grid of 14 squares laid over the fundus image. The percentage of each of the 14 squares that was covered by haemorrhages (and the average of the 14) was taken as the relative size of the RH. Inter-rater reliability and Intra-rater reliability were measured. |  | Subjective. Could be adapted for clinical use. |
| **Betz.P et al** Forensic Science International 1996. 78; 71-80. 9 | Post mortem study, morphometrical analysis of RHs in cases of physical abuse and controls. | This paper is included to record the methodology of morphometry of RH – after fixation of the eyeballs, sections at the level of the optic nerve were made. The area of the whole retina and the area of the retina showing haemorrhages were estimated using a 100-square grid (original size 1cm2 which was localized in the eyepiece of the microscope). | The extent was different between both groups.In physical abuse, massive RH was seen in at least 1 eye, 19.2%-73.2% of the entire retinal area.Control group 3.3-4.18%. | Comparison of the extent of the retinal bleeding was the aim of this study. No volume fraction was determined, though the area fraction is an estimate of this parameter. |

**References in Table 1**

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