

Pediatric Retinal Detachment in Indonesia: Clinical Characteristics, Risk Factors, and Treatment Outcomes

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Abstract

Purpose: To describe the clinical features and risk factors of pediatric retinal detachment among patients in Indonesia. **Methods:** This is a retrospective study involving 46 eyes of 34 children (younger than 18 years) diagnosed with pediatric retinal detachment. A detailed history was taken and a complete ophthalmic examination and a systemic examination were performed as required. Clinical characteristics, risk factors, and treatment choices were noted. Retinal detachment was categorized as tractional, exudative, or rhegmatogenous. **Results:** Mean patient age was 8.5 years (range, 0–18 years). Most patients (70%) were boys. Twelve (35%) patients had bilateral involvement at presentation. Tractional retinal detachment was found in 17 eyes (37%) and in this study was caused by retinopathy of prematurity (grade IV-V) in all cases. Exudative retinal detachment was found in 12 eyes (26%), the most common causes of which were panuveitis and Coat's disease (both 50%). Rhegmatogenous retinal detachment was found in 17 eyes (37%), the most common risk factor for which was trauma (58%). **Conclusions:** Different approaches are needed to treat pediatric retina detachment in patients with different risk factors. Recognition of risk factors and early management will help to prevent childhood blindness due to retinal detachment.

Keywords

Pediatric Retinal Detachment, Clinical Characteristics, Risk Factors

1. Introduction

Pediatric retinal detachment (RD) is a devastating ophthalmic condition if not properly treated. The prevalence of RD is reported as 12.4 cases per 100,000 in-

dividuals, of which 3.2% - 5.6% (0.38 - 0.69 cases per 100,000 individuals) are of pediatric age [1] [2] [3] [4]. Management of pediatric RD remains challenging due to the viscosity of pediatric vitreous, the difficulty of scleral buckling in developing eyes, and the risk of proliferative retinopathy caused by a raised immune response [2] [3] [5].

The surgical management of pediatric RD is difficult; therefore, prevention of the condition is important. An improved understanding of the etiological risk factors associated with the disease may help to avoid visual morbidity and childhood blindness. In addition, early detection and diagnosis is essential because timing is a crucial factor in the success of RD management. This is especially important in developing countries, where individuals often seek treatment too late for viable surgical management.

We performed this study to describe the clinical characteristics and most common risk factors for pediatric RD in the Cicendo National Eye Hospital (CNEH), as the top referral eye hospital in Indonesia.

2. Methods

This is a retrospective descriptive study utilizing hospital medical records of patients diagnosed with RD in 2013. All new patients under 18 years of age and diagnosed with RD by the consultant in the vitreoretinal unit were included. Age, sex, laterality, visual acuity, and type of RD were recorded. RD sub-types were classified by etiology, age group, risk factors, and management

3. Result

Retinal detachment was observed in 46 eyes of 34 pediatric patients. The clinical characteristics are shown in **Table 1**.

3.1. Characteristics of Retinal Detachment

The retinal detachment characteristics are shown in **Table 2**. The mean age of patients in this study was 8.5 years (range: 0 - 18 years), with 70% of cases being male. Twelve (35%) patients had bilateral involvement, with tractional RD and exudative RD affecting eight and four patients, respectively. Visual acuity determination was difficult because of age, but most cases had light perception (41%) followed by hand movement detection (29%). Visual acuity measurement was not possible for 13 (38%) patients. When stratified by RD sub-type, most patients had unilateral rhegmatogenous RD (37%) and bilateral tractional RD (37%).

3.2. Etiology, Risk Factors, and Management of Pediatric Retinal Detachment

The overall frequency of RD was highest in the 0 - 5 year age group, with tractional RD the most common sub-type (89%) in these patients. Retinopathy of prematurity (ROP) stage IV - V was the sole etiological factor in all cases of

Table 1. Clinical characteristic of retinal detachment.

Characteristics	Number/(%) (n = 46 eyes/34 patients)
Age (mean [years])	8.5
(range [years])	0 - 18
Sex (n = 34)	
Male	24 (70%)
Female	10 (29%)
Lateralization (n = 34)	
Unilateral	22 (65%)
Bilateral	12 (35%)
RD sub-type (n = 46)	
Tractional	17 (37%)
Exudative	12 (26%)
Rhegmatogenous	17 (37%)

Table 2. Clinical characteristics, etiology, and other risk factors stratified by retinal detachment sub-type.

	Tractional (n = 17 eyes/9 patients)	Exudative (n = 12 eyes/8 patients)	Rhegmatogenous (n = 17 eyes/17 patients)
Age (years)			
0 - 5	16/8 (89%)	4/2 (33; 25%)	3 (17%)
6 - 10	-	4/2 (33; 25%)	7 (41%)
11 - 15	1/1 (11%)	4/4 (33; 50%)	3 (17%)
16 - 18	-	-	4 (23%)
Sex			
Male	6 (67%)	6 (75%)	12 (70%)
Female	3 (33%)	2 (25%)	5 (30%)
Etiology & risk factors			
ROP stage IV - V	17/9 (100%)		
Coat's disease		4/4 (33; 50%)	
Panuveitis		8/4 (66; 50%)	
Trauma			10 (58%)
Myopia			4 (23%)
Intraocular surgery			1 (7%)
Unknown			2 (15%)

tractional RD.

By contrast, exudative RD was most commonly observed in the 11 - 15 year age group, with panuveitis and Coat's disease prevalent causes. Panuveitis is associated with infectious disease including tuberculosis (TB) and TORCH (Toxoplasma, Rubella, Cytomegalovirus and Herpes), as infection remains a leading cause of ocular inflammation in Indonesia. Coat's disease may occur in the first decade of life and has devastating visual sequelae if not managed early in the

Table 3. Management of pediatric retinal detachment.

Management	Tractional RD	Exudative RD	Rhegmatogenous RD
Observation	9 (100%)	4 (50%)	11 (64%)
Medication		4 (50%)	
Surgical			
Laser photocoagulation			1 (6%)
Scleral buckle (SB)			1 (6%)
Vitrectomy (VPP)			3 (18%)
VPP + SB			1 (6%)
Anatomical result			
Attached retina			1 (16%)
Re-detached			5 (84%)

disease process. In this study, we noted four patients with Coat's disease (11 - 15 years) that could not be treated with photocoagulation or vitreoretinal surgery because of advanced disease progression.

Rhegmatogenous RD was found in 37% of eyes, with 41% of these occurring in the 6 - 10 year age group. Trauma (58%) was the most common risk factor for this RD sub-type.

In this study, the primary management modality for RD was observation because most cases presented too late for effective medical or surgical treatment. Medication was given for cases of exudative RD with panuveitis as a risk factor. Vitreoretinal surgery was performed in 36% of cases; however, most had poor anatomical outcomes. **Table 3** shows the detail management of retinal detachment recorded.

4. Discussion

This study characterizes pediatric RD in a government tertiary referral hospital in Indonesia and highlights some differences in disease patterns compared with developed countries.

We found that ROP was the only cause of tractional RD in this study. Report from study involved of 21 health facilities in Indonesia, had a result of 5.05% (32/613) of premature babies that were diagnosed with ROP [6]. Similar studies from Mongolia, Malaysia, and Latin America detected more case of ROP [7]. In a report from Malaysia, 20 of 294 premature babies examined, about 7%, had ROP [8]. According to a 2005 report, two-thirds of the 50,000 children worldwide estimated to be blind from ROP are from Latin America. Unfortunately, more mature infants are developing severe ROP in countries with lower or modest levels of development than those in highly developed countries [7]. Further investigation of this risk factor needs to be prioritized because ROP plays an important factor in pediatric RD and childhood blindness.

Indonesia has a National Guideline for screening and treatment of ROP.

Based on data from the General Hospital in Jakarta, ROP prevalence had decreased between 2004 and 2010. In 2007, the reported prevalence of ROP was 21.7% with 71% of cases being at Stage 3. Subsequent estimates of prevalence were 14% and 18% in 2008 and 2009, respectively [6]. An important extension of the national guidelines means increasing the need for ROP centers in the country. Currently, ROP is only detected and managed at a small number of centers, usually tertiary care hospitals and certain private eye clinics, and many infants at risk do not have access to such facilities. Data from the 2010 ROP workshop reflect the high mortality of premature babies in Indonesia, especially in clinics with minimum neonatal facilities [6]. This study shows that ROP was the sole cause of pediatric tractional RD at a tertiary referral eye hospital in Indonesia (CNEH). Delay in the detection and treatment of RD was influenced by inadequate ophthalmic screening of premature babies, combined with parental reluctance to subject their child to potential surgery.

The most common risk factor for exudative RD was panuveitis secondary to TB and TORCH infection. The prevalence of TB in Indonesia is high and the estimated prevalence of disease in the pediatric population for 2015 was about 75,000. [9] In this study, 50% of cases with exudative RD had panuveitis as an underlying condition and all cases had a positive history of tuberculosis.

We found that another common cause of exudative RD was Coat's disease. This has been observed in previous case series, with Rumelt noting that 63% of cases of exudative RD were caused by the disease [1]. In developing countries such as Indonesia, regular retinal screening in children is a difficult public health strategy to implement. While a white pupil in a child is a diagnostic sign for Coat's disease, usually by this stage the retina has detached and laser photocoagulation is no longer a viable management option. Mjeren followed 15 cases of Coat's disease in the early stages of presentation for up to 28 months. These patients were treated with a combination of laser photocoagulation, cryotherapy, and vitreoretinal surgery. Stable visual outcomes and anatomic improvement were achieved in 12 cases with no enucleation necessary [10]. Comparatively, 50% of cases of exudative pediatric RD were due to Coat's disease in our cohort, but all presented at a late stage of disease (11 - 15 years of age group). This highlights the importance of regular retinal screening in childhood, as with early recognition and appropriate treatment, anatomical and visual rehabilitation in Coat's disease-associated RD can be achieved [10].

Thirty seven percent cases in this study were of the rhegmatogenous RD sub-type. Trauma remained the most common cause of RD in the 6 - 10 years of age group (58%), followed by myopia in 23% of cases. These findings are comparable to those of a study from Saudi Arabia, in which 32% and 17% of 152 eyes had rhegmatogenous RD secondary to trauma and myopia, respectively [2]. Similarly, Rumlet noted 41% and 11% of cases of RD, secondary to trauma and myopia, respectively [1]. However, in a Taiwanese report, Chang found that 37.5% of 146 patients below 18 years of age had rhegmatogenous RD as a result

of high myopia. In children, traumatic RD often occurs relatively late due to the support of a well-formed vitreous [11]. In a study of salient risk factors, Wenick found that congenital ocular abnormalities, prior ocular surgery, and trauma are principal causes of pediatric RD. By contrast, for the East Asian and older pediatric populations, myopia alone appears to be a major factor [1] [2] [12].

The surgical management of RD in our series was challenging because individuals typically presented late, resulting in poor anatomical outcomes. Consequently, retinal re-detachment occurred in 84% of cases. This is similar to that of an Indian report, in which most cases of pediatric RD presented late, with macular detachment a common finding. Even though complete retinal re-attachment was achieved, visual recovery was modest for most patients [5] [12].

Different disease risk factors often require different approaches in how the disease is managed. The management of pediatric RD in developing countries will differ from that of developed nations. It is common in Indonesia for individuals with pediatric RD to present for examination late. Facilities for modern vitreoretinal surgery are typically limited to only a few tertiary healthcare centers in developing countries. Therefore, improving screening programs and parental awareness of the need for swift treatment are both important factors in alleviating this burden of childhood disease.

Conflict of Interest

The authors declare that they have no conflict of interest.

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