

## Axial length in eyes with bilateral pediatric cataract at tertiary eye care center in Nepal: A preliminary report

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### ABSTRACT

The aim of the study was to determine the average axial length reading of the bilateral pediatric cataract undergoing cataract surgery. Pre-operative axial length measurement was done in 80 children below 15 years who had bilateral pediatric cataract. Axial length measurement was done in 56 fellow eyes. The axial length was measured under general anesthesia with the Accutome A-scan. The mean age was 69.7 months (SD=52.6), range from one month to 168 months. The mean axial length reading was 21.3 mm in operated eyes and 21.1 mm in fellow eyes. The range of axial length reading was 16.2 -31.5 mm in operated eyes and it was 16.5 -31.5 mm in fellow eyes. This short observation found that in bilateral pediatric cataract, the axial length value is similar in both operated and fellow eyes. Based on the axial length value of the operated eye, the patients with bilateral congenital cataract can undergo surgery in those eye hospitals where facilities of measurement of axial length is not available.

**Keywords:** Axial length, cataract surgery, congenital cataract.

Vision 2020 the Right to Sight focused the childhood blindness which was the priority areas for ophthalmology.<sup>1</sup> Among other diseases, the congenital cataracts are one of the public health issues and challenge to mitigate the childhood blindness in world including Nepal.<sup>2</sup> Cataract is the leading cause of blindness, constitutes 43.8% and 29.4% of childhood blindness in middle-income and low-income countries respectively.<sup>3</sup> The problems are still undesirable due to the inadequate operation facilities in time in countries like Nepal. Mostly the membranous, total, nuclear, lamellar and posterior congenital cataracts need immediate surgery. Ideally in pediatric cataract surgery, biometry needs to be done. Keratometry estimates the radius of curvature, means dioptric of power of cornea. Axial length (AL) is a measurement from the anterior surface of cornea to the posterior pole of the eye. Its value is essential for the calculation of the power of the intra-ocular lens (IOL).

To the best of our knowledge, this is the first report for the axial length reading in the children of Nepalese population. The objective of this study is to determine the average axial length reading of the bilateral pediatric cataract undergoing cataract surgery in Tilganga Institute of Ophthalmology (TIO). This preliminary report will help to do pediatric cataract surgery where the axial length is not available under general anesthesia.

The perspective retrospective study was designed to evaluate the pre-operative axial length measurement of

the subjects who had undergone cataract under the age of 15 years. All consecutive subjects were enrolled in this study from November 2007 to August 2008 at TIO, a tertiary eye care center in Nepal. It has full phase pediatric unit with the facility of general anesthesia as well as pediatric ophthalmologist. Only the bilateral congenital cataract cases were included where as other forms of cataract were excluded. Axial length is done under general anesthesia using the Accutome A scan. In the cooperative patients axial length value was taken before the induction of laryngeal mask anesthesia. Special form was designed to collect the data of study. Ethical approval was granted by Tilganga Institute of Ophthalmology Institution Review Committee. Verbal and written consent was taken from the guardians of the children. Collected data was edited, coded and entered in the excel 2007 then the analysis was done in SPSS version 11.5. Independent t-test was used for statistical significant. P-value less than 0.05 were considered as the significant.

**Table-1:** Descriptive statistics

Description	Age (months) (n=80)	AL average (operated eyes) (n=80)	AL average (fellow eyes) (n=56)
Mean	69.7	21.3	21.1
Std. Deviation	52.6	2.6	2.7
Minimum	6.0	16.2	16.5
Maximum	168.0	31.5	31.5

**Table-2:** Age distribution and axial length of operated and fellow eyes

Age (months)	AL average (operated eyes)			AL average (fellow eyes)			p-value*
	Mean	SD	Number	Mean	SD	Number	
0-6	18.4	1.4	4	18.1	1.5	3	0.82
7-18	19.5	1.8	16	19.6	1.8	13	0.93
19-60	21.7	2.6	21	21.5	2.9	20	0.87
61-168	22.1	2.5	39	22.1	2.5	20	0.96
Total	21.3	2.6	80	21.1	2.7	56	0.66

\* using unpaired t-test

Altogether 80 subjects with bilateral congenital cataract were included. The mean age was 69.7 months (SD=52.6), range from one month to 168 months. The mean axial length reading was 21.3 mm in operated eyes and 21.1 mm in fellow eyes. The range values of axial length reading in operated eyes were 16.2 -31.5 mm where as it was 16.5-31.5 mm in fellow eyes (Table-1).

This study had total 80 subjects with data of 80 operated eyes and 56 fellow eyes, so p-value for different age group was calculated by using independent t-test. The mean value of axial length in different age group is nearly equal in operated and fellow eye with no significant association ( $p > 0.05$ ) (Table-2).

Axial length reading and the axial length measurement are done routinely in all the adult patients who undergo cataract surgery in the outpatient basis. However for the children it can be done only under anesthesia.

Thus, the axial length and axial length calculation is a must for all children who undergo the pediatric cataract and intra-ocular lens implantation.

All the patients are thus made emmetropic at the time of surgery based on the IOL power calculation. Age wise there is no contraindication of the intra-ocular implantation in children. Till now, there has been no

study done on the axial length reading of the Nepalese children who has undergone the pediatric cataract surgery. Previous study compared the average axial lengths of the eye in the first, second and third year of life between the observed and control groups; they did not find any association in the obtained values.<sup>4</sup> Another study also found that there was no difference in the axial length bilateral cataract but

it was differed in unilateral. However, in children with unilateral congenital cataract the affected eye has a shorter axial length and a thinner lens.<sup>5</sup>

We concluded that in bilateral pediatric cataract the axial length value is similar in both operated and fellow eyes. The axial length value in operated eye is similar in bilateral cataract cases. Thus, in bilateral congenital cataract cases, the axial length value of the operated eyes can be taken as the reference for the surgery of the second eye in those eye hospitals where facilities of measurement of the axial length is not available.

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