Asymmetric Presentation of Retinopathy of Prematurity

Retinopathy of prematurity (ROP) usually has symmetric presentation and progression between fellow eyes. In this retrospective review of records, asymmetric presentation was noted in 16 (3.9%) out of 410 babies over a period of one year. Management and final outcome differed in 10 and 11 infants respectively. ROP need not always be symmetric and may require variable management.

Keywords: *Cryotherapy, Neonate, Screening.*

Retinopathy of prematurity (ROP) is usually a symmetric disease presentation [1]. However, Western literature reports asymmetry rates of 5.8%-25.4% [1-3], but there has not been any data from India regarding such presentation.

We carried out a retrospective review of records from ROP clinic over a period of one year (October 2015 to September 2016) at AIIMS, New Delhi, India. ROP was classified according to International Classification of Retinopathy of Prematurity (ICROP) 2005 [4]. Gestational history, previous treatment history, stage and zone of ROP, and management details (follow-up or laser photocoagulation or vitrectomy) were noted. Retinal falciform fold and disc macular drag were classified as 'sequalae'. Final outcome was categorized into: no ROP, regressed and attached, regressed but dragged, ROP sequalae or Stage 5 disease.

Out of 410 infants with ROP registered during the study period, 16 (3.9%) had asymmetric disease (***Web Table* I**). Mean (SD) gestational age (GA) was 29.6 (2.3) weeks and mean (SD) birthweight was 1269.3 (426.7) grams. Mean (SD) post-conceptional age (PCA) at presentation was 44.6 (10.9) weeks. Five infants were previously treated either with laser photocoagulation (n=3) or intravitreal Bevacizumab (n=1) or both (n=1). Ten infants had a similar zone but different stage of disease. Management differed between fellow eyes in ten babies (four were previously treated). Final outcome differed in between the fellow eyes in eleven babies.

One-fifth of the threshold ROP patients in Cryotherapy for Retinopathy of Prematurity (CRYO-ROP) study had asymmetric threshold disease at presentation [1]. Fielder, *et al*. [2] reported asymmetric ROP in 25.4% of patients with a difference of at least one stage according to ICROP (1984). Quinn, *et al*. [3] in a retrospective review of CRYO-ROP cohort, reported that acute-phase ROP had asymmetry ranging from 5.8% to 25% between 32 to 38 weeks PCA. Varied ROP course has been previously reported in Indian setting between twins but not among fellow eyes [5].

The probable reasons for low incidence noted in our study could be either a difference in classification systems used and/or regional geographic differences. CRYO-ROP study had classified based on threshold disease, where variation in number of clock hours or quadrant involvement in the same zone was taken as asymmetry while these will be considered similar as per ICROP 2005.

Local ocular factors might play a role in difference in disease activity between fellow eyes [2]. Possible mechanisms include regional variations of retinal neuro-vascular development and retinal light dose [6].

High concordance between fellow eyes in ROP often helps us prognosticate and plan treatment accordingly. However, ROP might present with asymmetric disease, and so it is essential to examine both eyes thoroughly and treat accordingly at each visit.

Contributors: DK, PC: conception/design of work; acquisition, analysis and interpretation of data; and drafting the manuscript. RT: interpretation of data for the work, and revising the manuscript critically for important intellectual content. All authors approved the final version and agree to be accountable for all aspects of work.
Funding: None; *Competing interest*: None stated.

DEVESH KUMAWAT, *PARIJAT CHANDRA AND RUCHIR TEWARI
Dr. Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi, India.
**parijatchandra@gmail.com*

REFERENCES

1. Cryotherapy for Retinopathy of Prematurity Cooperative Group. Multicenter trial of cryotherapy for retinopathy of prematurity: Three-month outcome. Arch Ophthalmol. 1999;108:195-204.
2. Fielder AR, Shaw DE, Robinson J, Ng YK. Natural history of retinopathy of prematurity: A prospective study. Eye Lond Engl. 1992;6:233-42.
3. Quinn GE, Dobson V, Biglan A, Evans J, Plotsky D, Hardy RJ. Correlation of retinopathy of prematurity in fellow eyes in the cryotherapy for Retinopathy of Prematurity Study. Arch Ophthalmol. 1995;113:469-73.

4. International Committee for the Classification of Retinopathy of Prematurity. The International Classification of Retinopathy of Prematurity revisited. Arch Ophthalmol. 2005;123:991-9.
5. Azad R, Chandra P, Patwardhan SD, Gupta A. Profile of asymmetrical retinopathy of prematurity in twins. Indian J Ophthalmol. 2010;58:209-11.
6. Fielder AR, Robinson J, Shaw DE, Ng YK, Moseley MJ. Light and retinopathy of prematurity: Does retinal location offer a clue? Pediatrics. 1992;89:648-53.

Free Style Libre Pro (FSLP) Flash Glucose Monitor (FGM) – A Novel Monitoring Tool for Children with Type 1 Diabetes Mellitus

Flash glucose monitoring using Free Style Libre Pro (FSLP) was undertaken among fifteen diabetic children. Data revealed high glycaemic variability, Time in Target Range (TIR) to be 27% and 12% of time in hypoglycaemia. Sensor insertion and retention were problematic in 33%. Though user friendly, sensors may need an additional adhesive plaster for retention.

Keywords: *Diagnosis, Glycosylated hemoglobin, Hypoglycemia*.

Flash glucose monitoring system (FGM), a method of glucose testing, is seen as hybrid between glucometers and continuous glucose monitoring systems (CGMS) [1]. Consensus recommendations for use of ambulatory glucose profile (AGP) in clinical practice have been proposed [2]. The utility of FGM in children with poor glycemic control and practical issues associated with FGM were analyzed in this study.

This observational study was done at the diabetic clinic of Institute of Child Health and Hospital for Children from October 2015 to June 2016. With ethical clearance and informed parental consent, fifteen children aged 10-15 years with type 1 diabetes mellitus of more than 2 years duration and with glycated hemoglobin (HbA1c) >10% were included. Free Style Libre Pro (FSLP) FGM equipment was used. The sensor was fitted in the posterior aspect of left arm and data was captured at the end of 2 weeks. Finger prick blood glucose was performed four times a day (thrice pre-meal and at 2 am). Sensor insertion, glycemic variability, time in target range (TIR) and hypoglycaemia and blood HbA1c were the study parameters.

Of the 15 sensors inserted, one got displaced on day 1 and one got stuck to the applicator. Insertion was successful in 13 (87%) children. Sensor was secured with additional plaster in all children, yet 3 (20%) got displaced. Complete data were available in 10 (67%) children at the end of 2 weeks.

Mean (SD) age of children was 11.8 (1.14) years. The median (IQR) of diabetes duration was 3 (2.75-5.75) years. The mean (SD) of HbA1c was 11.14 (1.54%) and insulin requirement was 1.4 (0.38) units/kg/day. The mean (SD) coefficient of variation as a measure of glycemic variability was 46.29 (10). The mean (SD) inter quartile range of glucose values was 161.3 (48.3) mg/dL. Average TIR was 27% while nearly 12% of time was spent in hypoglycemia. A good correlation between HbA1c measured in blood and that predicted by FGM was observed (correlation coefficient (r) = 0.81) as shown in ***Fig.* 1**.

The study group showed high glycemic variability as evidenced by high coefficient of variation and interquartile range [3]. Mean TIR was 27% which was similar to a previous study [4]. The goal of 70% of glucose values in target range which is termed as optimal glycemic control is difficult to achieve even in those with lower HbA1c as seen in that study. In addition, on an average 12% of time was spent in hypoglycemia which is much higher than the desirable level of 5% [5]. Most of the hypoglycemia were nocturnal and asymptomatic. FGM is useful in picking up asymptomatic nocturnal hypoglycemia.

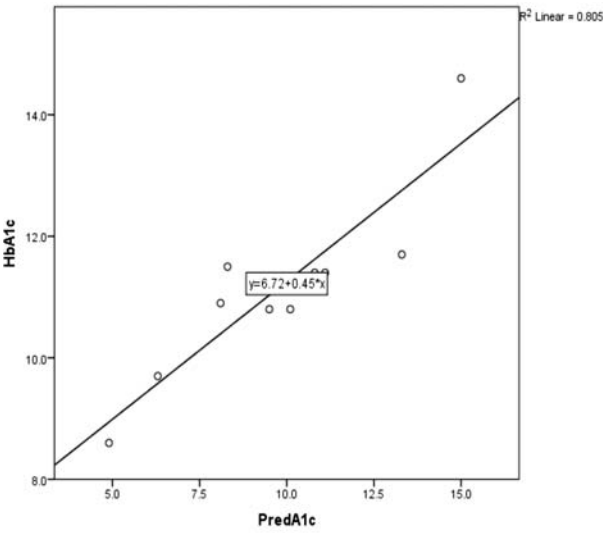

FIG. 1 *Correlation between HbA1c measured in blood (HbA1c) with predicted HbA1c (PredA1c) by flash glucose monitor.*

WEB TABLE I CHARACTERISTICS OF FELLOW EYES WITH ASYMMETRIC RETINOPATHY OF PREMATURITY

Case	*Zone (z), Stage (s) OD*	*Zone (z), Stage (s) OS*	*Treatment OD*	*Treatment OS*	*Final status OD*	*Final status OS*
1	z1, s3	z2, immature	LIO	-	Laser regressed	No ROP
2	z2, s2	z2, s3	LIO	LIO	Laser regressed	Laser regressed
3	z2, s3	z2, s4a	LIO	LSV	Laser regressed	Surgery regressed
4	z2, s5	z2, s4a	-	LSV	Stage 5 (closed funnel)	Surgery regressed
5	z1 APROP	z1, s5	LIO	LSV	Laser regressed	Surgery regressed (Low traction)
6	z1, s5	z2, s4a	LV	LIO	Stage 5 (open funnel)	Laser regressed
7	z2, s4a	z2, s2	LSV	LIO	Surgery regressed	Laser regressed
8	z2, s2	z3, immature	LIO	-	Laser regressed	No ROP
9	z2, s4b	s5 (closed funnel)	LSV	-	Surgery regressed but dragged	Stage 5 (closed funnel)
10	z2, s3	z2, s4b	LIO	LSV	Laser regressed	Surgery regressed but dragged
11	z2, s4b	z2, s4a	LSV	LSV	Surgery regressed but dragged	Surgery regressed
12	z2, s3	z2, s2	LIO	LIO	Laser regressed	Laser regressed
13	s5 (Closed funnel)	Falciform fold	-	-	Stage 5 (Closed funnel)	Sequalae
14	Falciform fold	5 (closed funnel)	-	-	Sequalae	Stage 5 (closed funnel)
15	z3, Immature	z3, s2	-	-	No ROP	Spontaneously Regressed
16	Falciform fold	5 (open funnel)	-	LV	Sequalae	Stage 5 (open funnel)

OD: Right eye, OS: Left eye, APROP: *Aggressive Posterior Retinopathy of Prematurity, LIO*: *Laser Indirect Ophthalmoscopy, LV: Lensectomy with vitrectomy, LSV: Lens Sparing Vitrectomy.*