Clinical characteristics and surgical outcomes of acute acquired concomitant esotropia in a tertiary referral centre in Malaysia

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ABSTRACT

Introduction: Acute acquired concomitant esotropia (AACE) is an uncommon type of strabismus that occurs due to interruption of fusion. Limited data are available on AACE from Asian countries especially from the Southeast Asian region. We aim to describe the clinical profile and surgical outcomes of AACE patients treated in a tertiary hospital in Malaysia.

Materials and Methods: We conducted a retrospective study of 20 patients aged 3-26 years who were diagnosed with AACE and attended Hospital Universiti Sains Malaysia, Kelantan, Malaysia, between January 2020 and June 2022 with follow-up periods a minimum of 12 months. Demographic data, clinical features, neuroimaging, surgical intervention, and final ocular alignment outcomes were recorded.

Results: The mean age of onset was 9.7±6.6 years. There were equal numbers of males and females in this study. Hypermetropia (45%) was the leading refractive error. Angle of deviation of 50 PD and more was documented in 50% of the patients at distance, and 70% of the patients at near fixation. Fifty per cent had an absence of stereoacuity at presentation. Neuroimaging was performed on 13 patients (65%), and two patients had intracranial pathology. All patients underwent bilateral medial rectus recession during primary surgery. Eighteen patients (90%) experienced excessive near work-related activities for >4 hours per day, and 19 patients (95%) achieved good ocular alignment, restoration of stereoacuity and resolved diplopia after the surgical intervention.

Conclusion: The mean age of onset was 9.7±6.6 years. Almost half of our patients had uncorrected hypermetropia. Furthermore, 90% of patients had excessive near-work activities, and 95% achieved good post-surgery alignment.

KEYWORDS:
Acute acquired concomitant esotropia, angle of deviation, near-work activities, post-surgery alignment

INTRODUCTION

Acute acquired concomitant esotropia (AACE) is a rare subtype of esotropia that affects older children and adults.[1] It occurs in 0.3% of childhood strabismus.[2] It presents with sudden onset large-angle esotropia with diplopia and minimal refractive error. AACE was initially classified into three subtypes by Burian and Miller in 1958: Type 1 (Swan), which is described as sudden onset esotropia due to interrupted fusion by monocular occlusion or vision loss; Type 2 (Burian–Franceschetti), which may be caused by physical or psychological stress and is demonstrated by large-angle deviations and low degree hyperopia and Type 3 (Bielschowsky), which is associated with moderate myopia or might result from excessive near-work activities.[2,3]

AACE has been reported previously to be associated with the presence of refractive error, decompensated esophoria with progressive intermittent, horizontal or binocular diplopia that converts into constant concomitant large-angle esotropia and a history of near-work activities.[1-4] Home confinement and online classes has increased the usage of computers, smartphones and tablets during the COVID-19 pandemic, thus increasing near-work activity and reduce time spent outdoors. A few recent studies reported an increase in the incidence of acquired concomitant esotropia due to near-work activities by the application of gadgets.[5-8]

There are published studies from Asian countries such as India, China and Korea that have reported good surgical outcomes in patients with AACE with the restoration of normal binocular vision and stereopsis.[2,5-6,8-15] However, limited data are available in Southeast Asian countries except Thailand. In this study, we aim to describe the clinical profile and surgical outcomes of AACE patients treated in a tertiary hospital in Malaysia.

MATERIALS AND METHODS

This was a retrospective case series conducted among patients with AACE who were diagnosed from January 2020 to June 2022 at Hospital Universiti Sains Malaysia, which is a tertiary referral centre in Malaysia. Approval was obtained from the Human Research Ethics Committee of Universiti Sains

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Table I: Summary of clinical cases.

Number	Age of onset / Gender	Presence of diplopia	Near work activities per day	BCVA	Cycloplegic refraction	Prism cover test	Stereopsis	Strabismus surgery	Neuroimaging	Type of acquired esotropia	Final outcome at one year after surgery
1	26/F	+	8	6/6 BE	RE: plano LE: +0.50	Dcc: AET 50+16 Ncc: AET 50+16	+	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
2	17/M	+	3	6/6 BE	RE: plano LE: plano	Dsc: LET 35 Nsc: LET 35	+	First surgery: BE MR Recession, Second surgery: BE LR resection	Large Extradural Haemorrhage at Left Parietal Lobe	Type I	BE: Orthophoria
3	16/M	-	10	6/6 BE	RE: -4.25 LE: - 4.50	Dcc: AET 50 Ncc: AET 50	+	BE MR Recession	NA	Type III	BE: Orthophoria
4	15/F	+	7	6/6 BE	RE: -1.50 LE: - 0.75	Dcc: AET 30 Ncc: AET 30	-	BE MR Recession	NA	Type III	BE: Orthophoria
5	12/F	+	2	6/9 RE 6/6 LE	RE: plano LE: plano	Dsc: RET 20 Nsc: RET 16	+	BE MR Recessio	Cystic lesion at Right cerebellum	Type I	BE: Orthophoria
6	12/F	+	5	6/6 RE 6/12 LE	RE: +0.75 LE: +1.25	Dcc: RET 30 Ncc: RET 50	-	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
7	12/F	-	5	6/6 BE	RE: +1.25 LE: +1.00	Dcc: RET 50 Ncc: RET 50	-	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
8	11/M	-	10	6/7.5 BE	RE: -9.00 LE: -8.25	Dcc: RET 40 Ncc: RET 50	+	BE MR Recession	NA	Type III	BE: Orthophoria
9	9/F	+	5	6/6 BE	RE: +1.25 LE: +3.75	Dcc: LET 50+10 Ncc: LET 50+20	-	BE MR Recession	CT-scan Brain Normal	Type II	Residual: AET 45
10	8/F	-	8	6/12 BE	RE: +0.75 LE: +1.00	Dcc: LET 50 Ncc: LET 50	-	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
11	8/M	-	5	6/12 RE 6/9 LE	RE: +2.25 LE: +2.25	Dcc: RET 50+10 Ncc: RET 50+10	+	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
12	7/M	+	8	6/7.5 BE	RE: +3.75 LE: +1.50	Dcc: RET 30 Ncc: RET 35	-	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
13	7/M	-	10	6/7.5 BE	RE: -0.75 LE: -1.00	Dcc: LET 50 Ncc: LET 50+20	+	BE MR Recession	NA	Type III	BE: Orthophoria
14	6/M	-	5	6/6 BE	RE: -0.75 LE: -0.75	Dcc: AET 40 Ncc: AET 50	-	BE MR Recession	NA	Type III	BE: Orthophoria
15	6/F	-	8	6/7.5 BE	RE:-1.50 LE: -3.00	Dcc: LET 30 Ncc: LET 40	+	BE MR Recession	NA	Type III	BE: Orthophoria
16	5/F	-	10	6/6 BE	RE: +1.25 LE: +0.75	Dcc: AET 45 Ncc: AET 50	+	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
17	5/M	-	6	6/9 RE 6/12 LE	RE: -0.75 LE: -1.00	Dcc: LET 25 Ncc: LET 40	+	BE MR Recession	NA	Type III	BE: Orthophoria
18	4/F	-	5	6/6 BE	RE: +1.75 LE: +0.75	Dcc: AET 50 Ncc: AET 50	-	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
19	4/M	-	6	6/6 BE	RE: +0.25 LE: +0.25	Dcc: AET 50+10 Ncc: AET 50+20	-	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria
20	3/M	-	5	6/6 BE	RE: +1.50 LE: +1.50	Dcc: AET 50 Ncc: AET 50	-	BE MR Recession	CT-scan Brain Normal	Type II	BE: Orthophoria

BE = both eyes, RE = right eye, LE = left eye, Dcc = distance with correction, Ncc = near with correction, Dsc = distance without glasses, Nsc = near without glasses, BCVA = best corrected visual acuity, AET = alternating esotropia, MR = medial rectus, LR = lateral rectus, CT = computed tomography

Table II: Distribution of type of AACE and age group.

Type	0 to 10 years old n=12 (%)	11 to 20 years old n=7 (%)	21 to 30 years old n=1 (%)
Type I	0 (0.0)	2 (29.0)	0 (0.0)
Type II	8 (67.0)	2 (29.0)	1 (100.0)
Type III	4 (33.0)	3 (42.0)	0 (0.0)

Malaysia (USM/JEPeM/21100675). The study was conducted in accordance with the Declaration of Helsinki. All participants and their guardians provided written informed consent for their clinical records to be used in this study.

The diagnosis of AACE was based on an acute onset of concomitant esotropia for weeks or months with photographic evidence of the absence of strabismus before esotropia onset, and concomitant esodeviation with normal gaze movement. Exclusion criteria included a history of ocular surgery (except for refractive surgery), ocular trauma, accommodative spasm and accommodative esotropia (hypermetropia ≥ +2.00 dioptres) with a resolution of deviation with full hyperopic correction.

Patients were identified based on the above inclusion and exclusion criteria, and their medical records were retrieved. Medical history and demographic data, which included age, gender and onset of diplopia, were collected. Duration of near-work activities at 30cm distance including smartphone or handheld gadget usage and reading books prior to the time of onset was recorded. Duration of near-work activities of >5 hours per day was defined as excessive near work.[2]

Best-corrected visual acuity (BCVA) was documented in all cases. Stereoacuity was based on the Frisby test. Orthoptic examinations, which included ocular movement and deviation, were performed using an alternate prism cover test performed with near (33cm) and distance fixations (6m). All patients underwent a meticulous ocular examination, including a slit-lamp assessment of the anterior segment and a dilated fundus examination.

Cycloplegic refraction was performed following the administration of 1% cyclopentolate eye drops in all patients. The spherical equivalent was calculated as the sum of the dioptric power of the sphere and half of the cylinder. Hypermetropia was defined as spherical equivalent of more than +0.50 Dioptre. Myopia was defined as more myopic than -0.50 Dioptre.

Systemic examinations, including neurological examinations, were performed on all patients. Computed tomography (CT) of the brain was done in patients with emmetropia and hypermetropia who had persistent esotropia after a full correction treatment with glasses.[2,16] Details of treatments were recorded, including glasses prescription, and details of surgical intervention were also recorded. The final visual acuity (VA), ocular alignment and stereopsis were documented at 12 months postoperative period.

Categorical data are shown as frequencies and percentages. Continuous variables are presented as the mean ± standard deviation (SD) and range. Statistical analyses were performed using SPSS Statistic version 27.0 (IBM Corp, Armonk, NY, USA).

RESULTS

A total of 20 patients with AACE were included in this study. Table I summarises the clinical profiles of all patients involved in this study. Table II describes the distribution of types of AACE according to decades of life. Twelve patients (60.0%) emerged during the first decade, seven patients (35%) during the second decade and one patient (5%) presented during the third decade of life. Type I had the least involvement, observed in two patients (10%), whereas Type II was the most prevalent, seen in 11 cases (55%). Type III occurred in seven patients (35%).

There were equal numbers of males and females in our study. The mean age of AACE onset was 9.7±6.6 years. Two of them had a history of prematurity ranging from 28 to 34 weeks. There was no family history of strabismus, and 90% (18 patients) had a history of excessive near-work activities related to handheld gadgets, laptop usage or reading books.

Duration of near-work ranged from 2 to 10 hours per day, with a mean duration of 6.55±2.37 hours. The near-work activities were related to playing games and watching YouTube on smartphones or other handheld gadgets such as tablets in 10 patients (50%), online classes in five patients (25%), reading activities in two patients (10%) and excessively playing small toys in one patient (5%). Out of 20 patients, two developed esotropia due to intracranial pathology. One patient had a history of motor vehicle accidents and underwent left craniotomy and clot evacuation. The other patient had a cystic tumour in the right cerebellum.

Furthermore, 16 patients (80%) had BCVA of 6/6 to 6/9 using Snellen charts, while four patients (20%) had poorer vision with BCVA of 6/12. Seven patients (35%) had myopia ranging from -0.75 to -9.00 Dioptre, nine patients (45%) had hypermetropia ranging from +0.75 to +3.75 Dioptre, and four patients (20.0%) were emmetropic. Ten patients (50.0%) had distance deviation of 45 Prism Dioptre (PD) or less, while the other half had distance deviation more than 50 PD. Six (30.0%) had near deviation of 45 PD or less, and 14 (70.0%) had near deviation more than 50 PD.

In addition, nine patients with hypermetropia were prescribed glasses. However, esotropia persisted, and these patients were subjected to neuroimaging. None of these patients had remarkable findings. Two of patients with emmetropia had normal imaging, despite having mild headache. The remaining seven patients were myopic did not

Table III: Comparison of published studies on acute acquired concomitant esotropia in Asian countries.

Variables	Present study	Neena et al [6]	Meng et al [10]	Kim and Noh [9]	Lekskul et al [2]	Wu et al [11]	Cai et al [12]	Lee et al [8]	Chen et al [14]
Country (year)	Malaysia (2024)	India (2022)	China (2021)	Korea (2021)	Thailand (2021)	China (2020)	China (2019)	Korea (2016)	China (2015)
Sample size	20	15	51	24	30	26	45	12	47
Mean age (year) ±SD	9.7±6.6	16.8±5.7	24	25.3±8.6	19.8±18.3	22.5	19±7.3	13.33±3.3	26.6±12.2
Gender, n (%)									
Male	10 (50.0)	11 (73.3)	33 (64.7)	17 (70.8)	NA	15 (57.7)	30 (66.7)	5 (41.7)	25 (53.2)
Female	10 (50.0)	4 (26.7)	18 (35.3)	7 (29.2)	NA	11 (42.3)	15 (33.3)	7 (58.3)	22 (46.8)
Excessive near-work, n (%)									
Yes	18 (90.0)	14 (93.3)	51 (100.0)	13 (54.2)	6 (20.0)	20 (76.9)	14 (31.1)	12 (100.0)	NA
No	2 (10.0)	1 (6.7)	0 (0.0)	11 (45.8)	24 (80.0)	6 (23.1)	31 (68.9)	0 (0.0)	NA
Mean (hours)±SD	6.55±2.37	8.6	9	NA	NA	NA	NA	6.08±1.78	NA
Clinical presentation, n (%)									
Diplopia	7 (35.0)	13 (86.7)	51 (100.0)	24 (100.0)	NA	26 (100.0)	NA	9 (75.0)	43 (91.4)
Best corrected visual acuity									
6/6 – 6/9	16 (80.0)	15 (100.0)	51 (100.0)	24 (100.0)	30.0 (100.0)	26 (100.0)	45 (100.0)	12 (100.0)	NA
6/12 and worse	4 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	NA
Refractive Error, n (%)									
Myopia	7 (35.0)	5 (33.3)	42 (82.4)	22 (91.6)	24 (80.0)	24 (92.3)	41 (91.1)	8 (66.7)	33 (70.3)
Hypermetropia	9 (45.0)	10 (66.7)	9 (17.6)	1 (4.2)	6 (20.0)	2 (7.7)	3 (6.7)	4 (33.3)	5 (10.6)
Emmetropia	4 (20.0)	0 (0.0)	0 (0.0)	1 (4.2)	N/A	0 (0.0)	1(2.2)	0 (0.0)	9 (19.1)
Esotropia (Prism Diopter)									
Mean deviation at distance		22.73	25	33.1±10.4	28.4±12.1	46.48	40.5±19.5	27.75±11.47	NA
a) 45 PD and less	10 (50.0)	15 (100.0)	51 (10018-40.0)	NA	NA	NA	NA	12 (100.0)	11.3±3.9 (Less than 20 PD)
b) 50 PD and more	10 (50.0)	0 (0.0)	0 (0.0)	NA	NA	NA	NA	0 (0.0)	40.7±14.0 (More than 20 PD)
Mean deviation at near		18.73	20	33.3±11.2	29.3±11.8	42.08	35.6±19.9	28.33±11.15	NA
a) 45 PD and less	6 (30.0)	15 (100.0)	51 (100.0)	NA	NA	NA	NA	NA	9.3±4.4 (Less than 20 PD)
b) 50 PD and more	14 (70.0)	0 (0.0)	0 (0.0)	NA	NA	NA	NA	NA	41.0±13.5 (More than 20 PD)
Stereoacuity, n (%)									
Present	10 (50.0)	13 (86.7)	N/A	18 (75.0)	NA	NA	12 (26.7)	4 (33.3)	47 (100.0)
Absent	10 (50.0)	2 (13.3)	N/A	6 (25.0)	NA	NA	NA	8 (66.7)	0 (0.0)
Neuroimaging, n (%)	13 (65.0)				13 (43.3)				
Normal	11 (84.6)	15 (100.0)	48 (94.1)	24 (100.0)	12 (92.3)	26 (100.0)	43 (95.6)	12 (100.0)	NA
Abnormal	2 (15.4)	0 (0.0)	3 (5.9)	0 (0.0)	1 (7.7)	0 (0.0)	2 (4.4)	0 (0.0)	2 (4.3)
Surgical intervention, n (%)	20 (100.0)	4 (26.7)	21 (41.2)	24 (100.0)	26 (86.7)	26 (100.0)	44 (97.8)	3 (25.0)	24 (51.1)
BE MR recession	20 (100.0)	1 (25.0)	NA	6 (25.0)	18 (69.2)	NA	4 (9.1)	3 (100.0)	7 (29.2)
Unilateral MR recession	NA	NA	NA	NA	6 (23.1)	NA	4 (9.1)	NA	NA
Unilateral MR recession and LR resection	NA	3 (75.0)	NA	18 (75.0)	2 (7.7)	NA	26 (59.1)	N/A	16 (66.7)
BE MR recession and unilateral LR resection	NA	NA	NA	NA	NA	NA	9 (20.4)	NA	NA
Unilateral LR resection	NA	NA	NA	NA	NA	NA	1 (2.3)	NA	1 (4.1)
Surgical outcome**, n (%)									
Orthophoria	19 (95.0)	NA	NA	NA	NA	1 (3.8)	NA	3 (100.0)	NA
(Definition)	0-10								
Residual esotropia	1 (5.0)	NA	0-25 PD	3.4±6.1*	0-8 PD	0-5 PD	0.8±1.6	NA	NA
Presence of stereoacuity, n %)	20 (100.0)	4 (100.0)	NA	24 (100.0)	26 (100.0)	NA	6 (13.6)	3 (100.0)	24 (100.0)

MR = Medial Rectus, LR = Lateral Rectus, PD = Prism Diopter, SD = Standard Deviation, NA=Not Aailable, *Mean ±SD, **based on number of patients who underwent surgical intervention

Fig. 1: A) Before onset of esotropia, B) Onset of esotropia, C) After the surgery

require imaging; none developed a neurological disease in long-term follow-up up to 12 months.

All patients had undergone bilateral medial rectus recession during primary surgery. One patient (5%) underwent a second operation: bilateral medial rectus recession followed by bilateral lateral rectus resection. Resolved diplopia, stereoacuity, and good ocular alignment were achieved in 19 patients (95%). One patient (5%) had residual esotropia during follow-up visit. Figure 1 displays photo documentation captured before the onset of esotropia, onset of esotropia and after the surgery for one of the patients recruited in this study.

DISCUSSION

There are limited reviews on AACE and its surgical outcomes in Asian countries. Neena et al from India described a report of 15 patients with AACE that was precipitated by excessive near-work during the COVID-19 home confinement.[10] There were a few studies in China by Meng et al., Wu et al., Cai et al., and Chen et al., regarding clinical characteristics, aetiologies, treatment and surgical outcomes of AACE.[10-12,14] However, the above studies have different inclusion and exclusion criteria and treatment choices compared to our study. Table III summarises published studies on AACE from Asian countries, including our study.

Recent studies have shown that AACE occurs in individuals of any age.[2,6,8-14] In our study, the mean age of onset of presentation was 9.7±6.6 which portrayed the onset of AACE at a slightly younger age compared to other published studies. This was probably due to our study was conducted during COVID-19 pandemic era where total lock downs, implementation of online classes and many children spent long hours with gadget at home. This has alerted the parents/care giver when the parents noticed sudden onset of eye deviations. In contrast, Kim and Noh reported that the mean age of onset of AACE was 25.3±8.6 in their study of 24 patients in 2021.[9] In aligning with studies conducted in Korea, Turkey and China, 50% of our patients were female, showing that there was no predominance in gender.[8,13,14] In contrast, males were predominant in other studies.[6,9,10,12]

Our study reported that 80% of our patients presented with refractive errors, where nine patients were hypermetropic and seven patients were myopic. None of the 18 patients were on corrective glasses during the initial consultation. Our results were in keeping with studies done by Neena et al. in India, where out of 15 patients with AACE, 10 were hypermetropic.[6] In contrast to our results, the patients were predominantly myopic in other published studies.[2,8-12,14] Bielschowsky claimed that uncorrected myopia led to the development of increased tonus of the medial rectus muscles and suggested that the increase in tonus can be explained by the tendency of individuals with uncorrected myopia to have excessive near-work activities, resulting in the development of esotropia.[17]

A systematic review and meta-analysis on seven large-scale population-based studies involving 23,541 children to determine the association of refractive errors and concomitant strabismus was reported in 2016 but no significant association was found between myopia and esotropia in the study.[18] On the other hand, children with myopia had a 5.23-fold increase in the risk of developing exotropia compared to those without significant ametropia. They also revealed a strong association between hypermetropia and esotropia. They found that hypermetropia starting at 2.00D to less than 3.00D imposes more than a 10-fold increase in the risk of developing concomitant esotropia. Strikingly, children with hyperopia of +5.00D or more had 218 times the risk of developing esotropia compared to children with 0.00D to less than 1.00D.[18,19]

Since the recent COVID-19 lockdown, where home confinement, school closure, and work-from-home restrictions were enforced, excessive near-work-related activities have been observed to upsurge. This has concurrently increased screen time, reduced time spent outdoors and digital eye strain.[20] Many studies have postulated that excessive smartphone use may be the underlying factor in AACE.[8,10,11,21] In our study, 18 patients were identified as excessive smartphones or handheld gadgets users whereby the average of 6.55±2.37 hours per day based on the statements of patients or their parents. Two patients admitted having reading activities at a distance of 30 cm or less for more than 5 hours per day, and one patient had a history of playing with small toys for more than 10 hours per day for 4 years. In published studies in Korea, 100%

of their patients admitted having excessive near-work activities with an average of 6-9 hours per day.[8,9] This is supported by the theory that excessive accommodation leads to an increase in medial rectus contraction, which in turn leads to the development of esotropia in AACE.

According to recent studies, AACE can affect both children and adults even when there is no corresponding neurological impairment.[8,13,15,22,23] This is in accordance with the outcomes of our study, which reported a series of patients who presented with AACE but had no other neurological or ocular abnormalities and whose examination revealed no intracranial pathology that would account for acute onset esodeviation. In the present study, 13 patients (65%) underwent neuroimaging studies. Of these, 13 patients had persistent esotropia despite full correction of hypermetropia as well as emmetropic patients, and the results were unremarkable while the other two patients had abnormalities on the neuroimaging due to intracranial bleeding post motor vehicle accident and tumour in the right cerebellum, respectively. We were selective in subjecting patients for neuroimaging, and we monitored those with myopia who did not portray any neurological deficit. These patients were not subjected to brain imaging. Montriwet et al., reported 41 patients with AACE; however, only 36 patients underwent brain and orbital neuroimaging studies. Two revealed a non-life-threatening intracranial pathology. None of their patients who did not undergo neuroimaging studies developed any neurological diseases during the follow-up period of 1.5±0.8 years.[25]

A few published studies have reported successful surgical outcomes in terms of good ocular alignment, with 100% of patients achieving postsurgical stereoacuity. Lee et al., operated on three patients, who underwent bilateral medial rectus recession, and achieved orthophoria postoperatively with a normal binocular single vision and no recurrence of esotropia,[8] which is in keeping with our study where 100% of our patients underwent bilateral medial rectus recession in their primary surgery. Also, 95% of our patients achieved good postoperative surgical outcomes in terms of fully resolved diplopia, good ocular alignment and the presence of stereopsis in 100% postoperatively. One patient had a residual of esodeviation of 45 PD in both distance and near fixation; this is due to poor compliance to glasses and persistent excessive near-work activities using handheld gadgets to play games and watching YouTube for an average of 4 hours per day postoperatively. In contrast, other authors opted for unilateral medial rectus recession and lateral rectus resection in most patients subjected to surgical intervention, and 100% regained stereopsis postoperatively with good ocular alignment.[6,9,14] We agree with the suggestion by Leskul et al., that increased recession of 0.5-1.0 mm results in good primary outcome.[2]

Our primary limitation lies in the retrospective nature of the study design. However, our strengths include successfully recruiting 20 patients within an 18-month period during the COVID-19 pandemic era at one of the country's referral centres.

CONCLUSION

Our study found that the mean age of onset of acute acquired concomitant esotropia (AACE) is slightly younger than in other published studies. There is no gender predilection. Excessive near-work activities contribute to the development of AACE with the mean hours spent being 6.55±2.37. Neuroimaging was performed in 65% of patients in view of emmetropia status and persistent esotropia despite full hypermetropic glasses correction, and 95% achieved good ocular alignment after surgery, where 100% regained stereopsis postoperatively.

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