



## Surge in Acute Acquired Comitant Esotropia During Covid Lockdown AIOC1

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### Abstract

Acute Acquired Comitant Esotropia (AACE) is seen occasionally in practice. Three classes are described (Burian). Recently smartphone use has shown an increased incidence. Purpose :To show that during covid lockdown there is a surge in the incidence of AACE compared to similar period prior. Material and Methods: A comparative study of AACE from June2020 to August 2021 (group A) and June2018 to August 2019 (Group B) was done in Eye institute. All had cycloplegic refraction, fundus, PBCT and MRI. Those who came within 2months of onset had injection Botox and followed Results: There were 41 cases in A and 11cases in B. Mean age in A was 11.23years (3-26) in Gr. A and 17 years (6-20). Mean angle of deviation was 39prisms (18-70) in gr. A and 33pd (25-45). Mean refractive error in A was +2D (-3D-+4D) with only 1 (2.4%) myopic. In B, it was - 1D (-5D -+2D) with 4 (36%) being myopic. Only one in both groups had neurological findings in MRI Conclusion: Covid lockdown has increased digital media use and a surge in AACE.

**Keywords:** Acute Acquired Comitant Esotropia (AACE); Covid; Lockdown

Acute acquired nonaccommodative comitant esotropia (AACE) is an uncommon type of acquired esotropia which occurs after infancy and may be associated with diplopia in older children. It has been recognised and classified into 3 types by Burian and Miller in 1958 [1]. Swan type-1, which is due to interrupted fusion by monocular occlusion or vision loss, Burian-Franceschetti type -2, which may be caused by stress and may be associated with small refractive errors and minimal accommodation; and Bielschowsky type- 3 which is associated with moderate myopia and result from excessive near work activities. In addition neurological problems, like Chiari malformation, posterior fossa tumors, hydrocephalus and others have been reported to produce comitant acquired esotropia [2-4]. Therefore it may warrant imaging. Excessive near work including excessive smartphone use has been found to be a cause for AACE [5,6]. With the advent of Covid 19, universal lockdown and introduction of web based online classes for students, including young children and online professional tasks, during the past two years, there has been a higher incidence of

AACE which may be attributable to the stress and accommodation load. Web-based online learning at home is associated with a longer screen time at the visual display units, instead of campus learning, which may lead to a decrease in outdoor activities and irregular sleep patterns. There has been reports of AANet during this period due to excessive smartphone use [7,8].

In this retrospective comparative analysis of cases pre-covid lockdown and during covid lockdown we aim to review our experience with AACE cases.

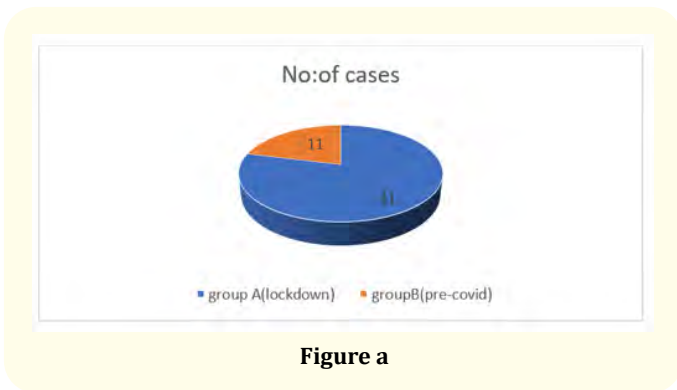
### Material and Methods

Medical records of all cases which presented with acute onset of comitant nonaccommodative esotropia to the department of Paediatric Ophthalmology and Strabismus, Comtrust Charitable Eye Hospital were analysed They were grouped as Group A, those during the period from June 2020 and August 2021 and Group B, those during the period from June 2018 to August 2019 i.e.

a similar period during covid lockdown and a similar period pre-covid. We have taken a similar period of the year to avoid differences during examination times or other factors which might influence the number of cases. All had testing of muscle balance including accommodation facility in older children, cycloplegic refraction, fundus, PBCT and MRI. Those patients who presented within 2 months of onset and were willing for Botox injection were given the same and followed up. Those who had stable angles after 6months and showed no progression or recovery, were taken up for surgical correction.

**Results**

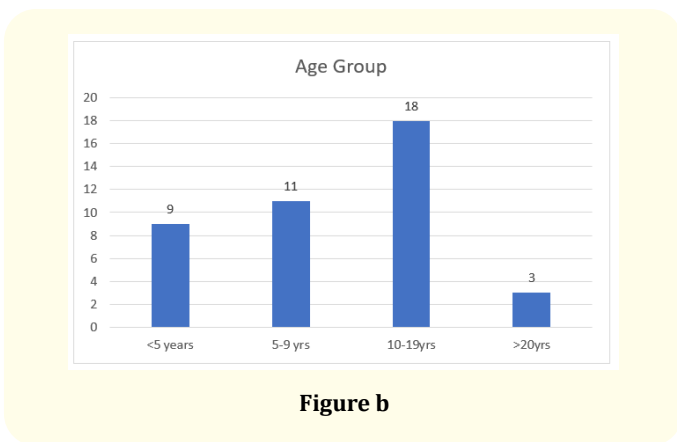
There were 41 cases in group A and 11cases in group B.



**Figure a**

79% of total cases were during covid lockdown.

60% of group A were males where as 61% of group B were females.



**Figure b**

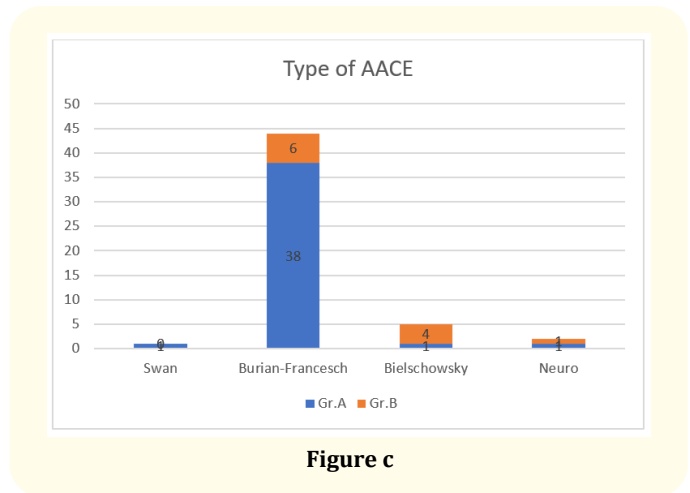
Majority -73% in Group A belonged to age group 5 to 19 years and 44% were between 10 to 19 years.

37 (90%) gave history of using mobiles for at least one hour in group A. In group B only 4 (36%) gave history of smartphone use.

31 i.e. 76% of patients in group A had better than 6/9 visual acuity without glasses.

Only 61% in group B had visual acuity better than 6/9.

In group A 38 out of 41 were Burian -Franceschetti type, with hypermetropia of <1.0 D in 80%.



**Figure c**

38 i.e. 93% of group A belonged to Burian Franceschetti group.

6 i.e. only 55% of group B belonged to Burian Franceschetti group.

None of them showed accommodation abnormalities

- Mean age was 11.23 years (3-26) in Gr. A and 17 years (6-20).
- Mean angle of deviation was 39 prisms (18-70) in gr. A and 33pd (25-45).
- Mean refractive error in A was +2D (-3D-+4D)with only 1 (2.4%) myopic. In B, it was -1D (-5D -+2D) with 4 (36%) being myopic.
- Only one in both groups had neurological findings in MRI and were referred to the neurosurgeon. One in group A had a pineal mass lesion. In group B one had an arachnoid cyst and was followed up.

- 5 patients had Botox injection 5 IU to both MR, out of which 4 showed recurrence of squinting after 12 weeks post injection. 6 patients had surgical correction. All had recess-resect procedure with one inferior oblique recession as well.

## Discussion

Web based online classes and jobs have a great impact on visual demand which is shown by the great number of AACE (79%) cases during lockdown. Majority of the cases (93%) during this lockdown period was Burian Franceschetti type. Lee., *et al.* have shown all their cases to belong to Bielschowsky type whereas in group A we had only one case (2.4%) in this type with myopia. In the precovid series 4 i.e. 36% belonged to Bielschowsky type. Amit Mohan., *et al.* [9] have shown a mean age of 12.5 years during the lockdown. 73% of our cases during lockdown belonged to the age group 5 to 19 years whereas 44% were between 11 to 19 years which demands more online work which also points to the causative factor as use of digital media especially smartphones. Awareness need to be created to reduce smartphone use.

## Conclusion

Covid lockdown has increased digital media use and a surge in AACE. The high percentage of students who need visual demand at online classes are at high risk of developing AACE and need to be educated on visual hygiene at computer and smart phones and restrict their use appropriately.

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