Increased Screen Time – A Pandemic Era Trigger for Neuro-Cardiogenic Syncope

The COVID-19 pandemic has resulted in a revamp of our everyday life, which is being dubbed as the new normal. As people get adjusted to work and study from home, there are new challenges in maintaining physical and mental health. An unusual pattern noted by the author is an increase in the number of children diagnosed with autonomic syncope in recent months. Between August and November, 2020, 16 children were diagnosed with neuro-cardiogenic syncope in the author's clinic, as compared to only three children during the same period in 2019. The age group of these children varied between 7-16 years. All children were subject to a detailed history regarding the event as well as potential red flag signs [1]. All episodes happened during the daytime and when the children were either seated or standing. None of the episodes happened during an exertion; although, in one child, there were three episodes that happened immediately after an exertion. Almost all episodes were preceded by a prodromal symptom which included light headedness, aura and/or vertigo. There was a prompt and complete recovery and there were no injuries. The children presented for evaluation after a median (range) time of 2 days (4 hours – 7 days) after the event. They underwent recording of postural vital signs and a standardized 12 lead electrocardiogram.

When enquired, each of the parents revealed a concern about increased daily screen time on smart devices for their children. The older children spent more time on the screen due to a cramped schedule of online classes while in the younger children, smartphone use replaced other forms of physical activity curtailed by COVID-induced lockdowns. The family were counselled about lifestyle modifications including sleep hygiene, adequate water and salt intake and reduction of screen time. Further evaluation for autonomic syncope was not carried out. All parents were contacted three to six months after their presentation to assess the efficacy of the intervention. The parents reported compliance with the suggested lifestyle measures and no recurrence of syncope during the short period of follow-up.

Neuro-cardiogenic syncope is common in children with 1 in 6 children reported to have at least one episode before adulthood [2]. It is possible that the increased screen time and exposure to high-definition screens results in increased eye strain and fatigue which reduces the threshold for fainting. In particular, high color temperature display and display flickering have been shown to cause eye fatigue [3]. Dizziness and pre-syncope have previously been reported to be potential adverse events of smartphone use, and syncope is likely an extension of the same pathophysiological process [4].

The findings are based on personal observations in clinical practice and highlight the importance of a detailed history in evaluation of syncope. Prospective studies with assessment of multiple associated factors of syncope may elucidate this issue further. However, till that time, pediatricians should continue to counsel the parents about the importance of limiting screen time in children.

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Should High Flow Nasal Cannula Therapy Be the Primary Mode of Respiratory Support in a Pediatric Intensive Care Unit? Questions Remain!

We read with interest the recent paper on high flow nasal cannula (HFNC) therapy as a primary mode of respiratory support in a pediatric intensive care unit (PICU) [1]. To better understand the paper, we request response to the following queries:

i) As the aim of the study was to assess the efficacy of HFNC as the primary mode of respiratory support in PICU, we think that a cross sectional study design was inappropriate. Instead, a randomized controlled trial (RCT) study design, if used, would have given clearer answers. In the RCT, other modes of non-invasive ventilation (NIV) could have been used as the comparator and the primary outcome measured could have been the percentage of children going on to invasive mechanical ventilation.

ii) The authors mention targeting oxygen concentration between 92-97% for all children between 1 month to 16 years? Is there a validated reference or protocol for adjusting FiO_2 to target such a saturation up to 97%?

iii) The exclusion criteria do not mention children with congenital cyanotic heart disease. Should this group not have been excluded as the methodology adopted required monitoring of oxygen saturation and adjustment of FiO_2 to keep arterial oxygen concentration between 92-97% and for calculation of saturation to FiO_2 (SF) ratio.

iv) We also want to know more about the Respiratory Clinical Score that was used to monitor the study children. This scoring system, as per our understanding, was not meant for use in children admitted to the PICU and on respiratory support [2]. Similarly, we also want to know about validation of this tool in Indian children? We feel that assessment of dyspnea using respiratory clinical score in children on HFNC would have been incorrect as the given score has many points like – "hyperactivity, increased coughing after play, decreased appetite" which cannot be assessed in the PICU and some scores like "agitation" are likely to be scored higher in the PICU setting with a child on respiratory support.

v) On going through the original article [3], with regard to use of COMFORT score, which in this study was used for assessing the tolerability of HFNC, we find scores for respiratory support which use responses that include "respiratory response" which is scored using terms like "resistance to ventilator, actively breathes against ventilator, fights ventilator etc" similarly other heads like "muscle tone assessment facial tension assessment" which are inappropriate in this setting/would have yielded inappropriate results. Modifications of this scoring system to use it to determine sedation and dose adjustments that need to be done depending on the assessed score. There is no mention about use of this score to change the dose of sedation or if the original score was used it may not again be appropriate.

vi) We would also want to know how the authors derived the determined sample size and assumed 50% risk reduction and achieved the same in exactly one year.

vii) **Table I** mentions the total number of children in HFNC responders' group to be 188 [1]. But on totalling the number of cases across diagnoses, the total sums up to only 186. There thus is missing data of 2 children. There are 2 extra diagnoses amongst the non-responders having 19 diagnoses versus 17 children. Even though we did consider the same child to have more than one diagnosis in the non-responder group, but having two less diagnoses compared to the total number of children in the responder group left us perplexed.

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AUTHOR'S REPLY

We thank the readers for their interest.

i) We agree that an RCT would have been ideal clinical design. If a comparator group of NIV is used, then there is a possibility of unnecessarily exposing large number of children to this modality when they could be successfully managed on lesser invasive support.

ii) The PALICC guidelines mention targeting a saturation of 92-97% in children with mild ARDS [1]; similar targets have also been used in other studies [2]. For calculation of SF ratio, the PALICC guidelines recommend titrating FIO2 to keep SpO2 between 92-97%.

iii) Children with cyanotic heart disease were excluded.

iv) A respiratory clinical score with the following parameters was calculated: age specific respiratory rate scores 0 to 3, retractions 0 to 3, dyspnea 0 to 3, and wheeze 0 to 3. Total score ranged between 0 for normal and 12 at the extremes. This score has been used in the PICU to assess effectiveness of HFNC [3]. The score has not been validated in Indian children but there is no plausible reason to believe that RR, retractions, wheezing or dyspnea would be different in Indian children.

v) COMFORT score has also been used in non-ventilated patients in the PICU [4].

vi) For calculation of sample size, a baseline risk for need of ventilation as 16% was assumed in children with respiratory distress presenting to the emergency [5]. We hypothesised that HFNC would reduce the risk by 50% (absolute reduction of 8 percentage points). Using alphaerror of 0.05 and for 90% power, we calculated a sample size of 178. To allow for potential 10% recruitment failure rate, required sample size was increased to 200.

vii) We agree that numbers add to 186 for diagnosis, and regret the typographical error.

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