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Contents lists available at ScienceDirect

International Journal of Pediatric Otorhinolaryngology

journal homepage: www.elsevier.com/locate/ijporl

Interrupted cochlear implant habilitation due to COVID-19 pandemic-ways and means to overcome this

1. Introduction

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome virus 2(SARS-CoV-2) [1]. Few alive today have lived through a rapidly spreading health disaster like the COVID-19. This outbreak has challenged the effective operation of the health care system across the globe. The R_0 of COVID-19 is valued to be approximately 3 justifying postponing non urgent face-to-face consultations and surgeries unless there is risk of losing the patient [2]. Effective measures have to be taken to protect the susceptible population that includes children, elderly, and health care workers [3].

Cochlear implant is a standard medical-surgical treatment for bilateral severe to profound hearing loss with no benefit with hearing aid, for the past 40 years [4]. However, The cochlear implant(CI) technology provides access to sound, but, habilitation with a nurturing spoken language environment is what aids in giving meaning to the sound and, this systematic and rigorous training helps attain full auditory potential [5]. CI aids in eliminating anxiety and depression, as well as improving the quality of life and coping strategies of a hearing impaired patient [6]. Any delay or failure in habilitation is likely to result in suboptimal patient outcomes and impact the psychology of the patient and family. However, the mystifying nature of this virus has warranted special care and modification of all post cochlear implant (CI) habilitation classes and in-person sessions.

This article elucidates challenges faced in conducting uninterrupted habilitation in times of the COVID-19 pandemic. It also brings forth possible innovative means our institute is implementing in reaching out to patients, modification of in person habilitation sessions and ways of keeping patients and their families motivated and not losing them to follow-up in such tiring times.

1.1. Importance of cochlear implant habilitation

Early identification of hearing loss and provision of early access to auditory stimuli is crucial for the development of age appropriate linguistic competence in a congenitally deaf child [7]. A comprehensive habilitation program is needed to help an implantee utilize auditory signals and integrate components of communication that is listening, speech, language, reading and thinking. The more support the family received the less concerned were they of the child future [8]. Hearing loss is an independent risk factor for dementia and poor general health [9]. In adult implantees cochlear implantation with post-operative rehabilitation can improve cognitive and speech perception outcomes [10]. Successful rehabilitation in an adult depends on the extent of

adaptive neural plasticity and the extent the brain can reclaim auditory processing after implantation [11]. Children of permanent childhood hearing loss are at a risk of developing emotional and behavioural difficulties [12]. Literature is also proof of the association between hearing loss in adults, which leads to social isolation and can contribute to clinical depression [13]. The importance of uninterrupted cochlear implant habilitation cannot be undermined as it directly impacts the outcome of the surgery.

1.2. Challenges faced by the family and the institution in providing cochlear implant habilitation during pandemic

The COVID-19 pandemic, has psychologically impacted all across the globe. The impact is more profound in the lives of the cochlear implantees seeking habilitation and facing technical challenges with the implant [14]. The social distancing norms and the reduced public transport adds to the trouble of the implantees coming from low-socioeconomic background and less motivated families. It's tough for young children to wear mask and express their difficulty in describing their health status adding to the challenge of protecting this group of population [15]. Falling prey to erroneous information, families face anxiety and often take incorrect medical decision. Institutions providing habilitation have to take care of both its health workers and patients. Providing its workers adequate information, preparing the health care providers for the job and it's challenges on how to take precautions can prevent moral injury [16]. Institution has to incur unplanned expense in setting up websites, apps and training of their audiologists and habilitationists for in cooperating tele-medicine as their treatment method. Telemedicine issues like privacy, consent and payment need to be kept in mind before in cooperating it as an integral tool for treatment [17]. Telemedicine is going to continue to be the first choice in order to maintain social distancing and thus limiting in person care to most urgent cases.

1.3. Measures to provide seamless habilitation during the pandemic

It is of prime importance to take adequate precautions and robust protocols aimed at safeguarding the health care workers and the patient. To prevent cross infection, telephonic appointments must be given after obtaining a 2 week travel history, history of fever, upper respiratory tract infection and exposure to a COVID positive patient [18]. With the high viral load in the nasal cavity compared to throat [19]. Strict droplet precaution are recommended, masks made mandatory for everyone coming to the institute, cloth, surgical mask and N95 considered equally

<https://doi.org/10.1016/j.ijporl.2020.110327>

Received 6 June 2020; Received in revised form 17 August 2020; Accepted 18 August 2020

Available online 25 August 2020

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effective [20]. Temperature check of the patient and the attendee must be performed at the time of entry into the institute. We must ensure to maintain safe distance between the implantee and habilitationist and allow only 1 attendee with the paediatric patient. Infected droplets can spread up to 1–2 m and deposit on the surface, and remain viable in favourable conditions but get destroyed in less than a minute with sodium hypochlorite and hydrogen peroxide [21]. All surfaces of the room should be cleaned with sodium hypochlorite after every session and all toys used in therapy must be sanitised. Patients must be motivated to follow-up with tele-habilitation till the next face to face session is deemed necessary, this can help in sustaining the patient-habilitationist relationship. The habilitationist also undergoes an everyday temperature check and clothes a mask, gloves and face shield to reduce the risk of exposure. The use of transparent mask with full face visibility can aid in lip reading for the hearing-impaired patient. The hub and spoke model of smaller habilitation centres in smaller towns, to reduce travel is the need of the hour.

Telemedicine and E-learning (electronic-learning) an experiment of the past, is the necessity of the day. It has served as a tool in specialized healthcare, particularly aiding patients in remote locations with limited access to standardized healthcare services [22]. Tele-therapeutic multimodal systems like “train2hear” enables the adult CI users to perform a structured and therapist guided rehabilitation session independent of time, location, and provides a cost-effective and tailored rehabilitation platform to the users [23]. Accessing tele-habilitation on verified digital platforms like websites and apps and hyperlinks created by the implant companies and parent institutions is the way to go, backed with constant encouragement of the patient through text messages, and one-on-one chat platforms. Tele-mapping in times of troubleshooting and real-time video-conferencing with patients who have access to smartphones is also gaining popularity in many centres [24]. Pre-recorded animated sessions can be created and ample database can be made freely accessible to the implantees in their preferred language. Intricately involving the parents as primary teachers and therapists are possible with platforms like Sound steps AVT Direct an online parent education and therapy service available to families of babies and young children with hearing loss [25]. All these habilitation modifications have to be followed till the candidate COVID-19 vaccine is made available for the general public.

2. Conclusion

Unprecedented times call for unprecedented measures, as the world, by and large, grapples with a new way of life; it is impossible to not see the impact on post-CI implantees. Digital revolution, construction of more websites, and apps can support in creating more care space for this group of patients. Though technology has come to stay, but there is no substitute for human touch. Humble actions of repeated follow-up can provide additional psychological support to the family and the patient in this hour. Planning a family-centred uninterrupted rehabilitation approach a key to navigating through this unforeseen time. Educating the health care professionals regarding safety precautions can help eliminate their anxiety in imparting in-person care. We would like to call upon societies to share their experience in addressing the impact of this unforeseen circumstance on implantees. With a lack of clarity on how long this situation is here to stay, we must act wisely and change swiftly as the situation demands.

Funding

The author received no financial support for the research, authorship or publication of this article.

Human/animal rights statement

This article does not contain any studies with animals performed by

any of the authors.

Declaration of competing interest

The author declares no potential conflict of interest to the research, authorship, and/or publication of this article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijporl.2020.110327>.

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