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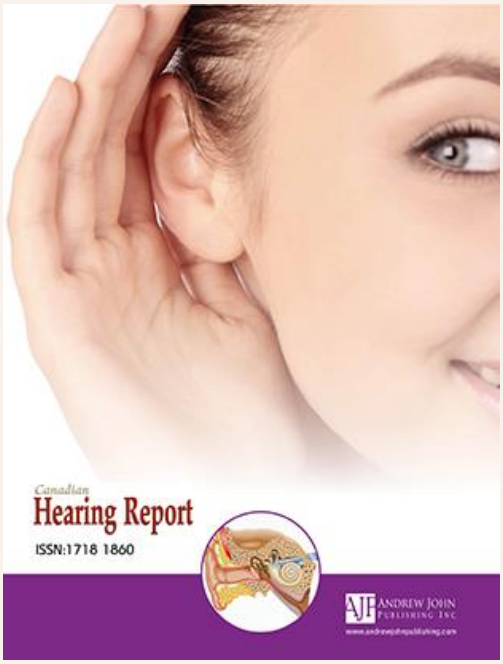

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Journal Report from Canadian Hearing Report Secretaire

By Razia K Ahmed*

EDITORIAL NOTE

This is exultant to offer you the fall of issue 2 of Volume 14 of Canadian Hearing Report. The journal auspiciously released 1st issue of volume 14 in August. With the kind support of editors, reviewers and authors, the team is able to release this issue within time. This is prideful for us that printed copied of the first issue were also brought out and sold within single month. Canadian Hearing Report magazine is rather getting admirable among senior as well as young researchers, scholars, audiologists and sttudents. The primary focus of the journal is to publicize the updated researches in the area of Ear healthcare, Auditory training or advancement in hearing aid technologies, Diagnosis of hearing impairment.

We are not only focused on academics and article publishing but also we welcome the industrial sectors for advertisements. This in turn updates the readers about the updated technology available in the market and the companies that are engaged in manufacturing of that product.

As we all are aware that COVID-19 has completely changed the scenario. The professionals who prefer printed magazines are now in favour of E-journals. E-journals are superior for searching the selected material and in precise format. And so, the journal CHR meets the requirement of the readers.

The visitor's traffic on the journal website is constant escalating and therefore we have decided to redraft the PDF. To make the magazine more fascinating among the audience we are now going to adjoin experienced researchers/audiologists universally and publish their interviews, research experience in the core area, biography.

To promote and encourage young researchers and students the journal has started publishing commentaries, short communications, mini reviews, research posters, opinion articles, features, and other such additional article types. In response to the same we are getting numerous commentaries and short reviews. Out of which few quality articles has been published in this 2nd issue. The processing of these articles are same as of full length research articles, initially step up with preliminary quality/plagiarism check followed by peer review process, editors' approval, formatting and editing, then proceed for final publication. The graduate as well as post graduate students are enthusiastically coming up with their articles.

We are also providing reprints of the articles/issue(s)/volume(s) or custom reprints to the authors on request. Apart from that we welcome Institutes/ Universities/Organizations to utilize the journal platform for global announcement regarding Conferences and recently initiated programmes or courses. This helps the scholars in grabbing the opportunities within time.

Finally, we would like to acknowledge the contributions of editors, reviewers and authors in the journal. Moreover, we exceed the gratitude to the coordinators, graphics team, web team, QC team, advisory members and other supporting hands for their precious support and making the issue release of the journal successful punctually on time. The journals' growth reflects the hard work of the team members. We request the website visitors and readers of the journal to send us their valuable comments/feedback so that we can make the upcoming issue more captivating. Your views will be acknowledged.

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Canadian Hearing Report

Revue canadienne d'audition

It's hard to believe, but 2020 marks the 15th anniversary of *Canadian Hearing Report*. We have a lot to celebrate!

CHR has provided hearing health professionals with the most current information on trends, technology, and the latest thinking in hearing health for the past 15 years, and we have only just begun!

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The industry has changed over the past few years and will continue to in the future – so will *Canadian Hearing Report*. The journal will continue to evolve and support the hearing health care professionals and the hearing health care industry in this exciting and important time.

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Delaying the Progression of Presbycusis: Role of Antioxidant Vitamins

By Iman Ibrahim*

COMMENTARY

Age-Related Hearing Loss (ARHL) is a gradual and progressive deterioration in hearing. It is a multifactorial process, resulting from a combination of various factors such as genetic predisposition, vascular and cognitive impairment, loss of auditory neurons such as spiral ganglion neurons, and deterioration of cochlear hair cells function [1]. In Canada, AHLR (akapresbycusis) occurs in 38.3% of those aged 60-69 and 65% of those aged 70-79 [2].

Heritability plays a significant role in the occurrence of presbycusis in humans, where 25%-75% of the variance in its pathology reveals a genetic component. Examples of genetic mutations that are linked to ARHL include polymorphisms in the genes coding detoxification enzymes (such as glutathione S-transferase and N-acetyl transferase 2), and variants of the SOD2 gene which encode a Mitochondrial Superoxide Dismutase enzyme (MnSOD) [3].

There are several subtypes of presbycusis (sensory, neural, metabolic, mechanical, mixed, and indeterminate), each result from a different mechanism and exhibit a characteristic pattern of hearing loss manifested in audiograms. In sensory presbyacusis, there is a loss of sensory hair cells in the organ of Corti due to accumulation of lipofuscin pigment granules, a process originates in the basal turn and slowly progresses towards the apex. Audiogram exhibits an abrupt steep high-frequency SNHL. The neural subtype occurs as a result of atrophy of spiral ganglion and cochlear neurons. It's a slowly progressive process where the audiogram shows a ski-slope towards the high frequencies.

The metabolic (aka strial/vascular) subtype there is atrophy of striavascularis which maintains the chemical and bioelectric balance and metabolic health of the cochlea. It results in slowly progressive SNHL with a flat-curve audiogram because the entire cochlea is affected. Finally, the mechanical (aka cochlear conductive) presbyacusis, which occurs due to stiffness of the basilar membrane in the cochlea with a ski-slope hearing loss towards high frequencies in the audiogram. There are also mixed types that exhibit various combinations of the four pathologies, as well as indeterminate which is slowly progressive SNHL with age with no obvious microscopic cochlear pathology. It could result from a central pathology and is commonly associated with poor speech discrimination [4].

Because mitochondrial mutations and/or dysfunction play a role in the pathology and course of aging in general and presbyacusis in particular, attempting at reducing the oxidative stress and the production of ROS has been studied as potential management that could slow the progress of presbyacusis [5]. This goal can be achieved by 1) decreasing exposure to substances that have oxidizing properties, 2) stabilizing the process of energy production in the mitochondria to decrease the oxidative stress, or 3) increasing the level of antioxidants, both endogenous and exogenous. The use of antioxidant supplements and multivitamin preparation (particularly vitamins A, C, E, and selenium) may quench the ROS and decrease cell damage. Certain lifestyle changes might help to improve cell function and protect cells from mitochondrial damage. Such changes include consumption of plant-derived nutrients, avoiding processed foods, refined sugars, and saturated fats, caloric dietary restriction, and the daily intake of fruits and vegetables [6].

The author of this article-along with coauthors-published a review study that investigated the effect of Antioxidant Vitamins as Adjuvant Therapy for Sudden Sensorineural Hearing Loss [6].

Currently, the regimen for SSNHL treatment consists of steroids (prednisone or methyl prednisone). However, the benefits of antioxidants are currently the focus of SSNHL management as an adjuvant to the treatment [7].

There are a few postulated mechanisms to explain the patho-physiologies in SSNHL, such as (1) labyrinthine viral infection (17%-33% of SSNHL patients recall a recent viral illness); (2) labyrinthine vascular compromise (the cochlea is an end-organ with no collateral vasculature; thrombosis, embolus, vasospasm, or any pathology that results in reduced blood flow to the cochlea can result in SSNHL; (3) intra-cochlear membrane ruptures - rupture of either the membranes that separate the inner ear from the middle ear or the delicate membranes within the cochlea that separate the peri-lymphatic and endolymphatic spaces; (4) immune-mediated inner ear disease-SSNHL is well documented in autoimmune diseases, such as Cogan syndrome and systemic lupus erythematosus; and (5) iron

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deficiency anaemia, where iron, in addition to zinc and copper, is essential to break down the free radicals for the enzymatic antioxidants [8-10].

The presence of vascular compromise of the cochlea as a postulated mechanism for both ARHL and SSNHL could explain the protective role of antioxidant vitamins in managing both conditions.

Antioxidants neutralize the oxidative stress by enhancing cellular defenses and hence protect the cell membranes [11]. A few studies investigated the effect of antioxidants on SSNHL, most of them reported a significant improvement in the patients who receive antioxidants as an adjuvant treatment for SSNHL.

Each vitamin exhibits a different mechanism of action. While vitamin A can reduce the concentration of singlet oxygen and repair damaged hair cells, vitamin E can reduce peroxyl radicals in the cell membrane, and vitamin C can detoxify free radicals in the aqueous phase [12].

So far, the evidence is inconclusive concerning which vitamin or vitamin combination(s) is more effective, and in what dosage. Further studies are required to test the effect of each vitamin individually, as well as giving different combinations of these vitamins to find the most effective vitamin and/or combination of vitamins and their dosage to be routinely administered either as SSNHL adjuvant therapy or to slow down the progression of ARHL.

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Advances in Surgical Techniques for Cochlear Implantation

By Jessica Philip*

COMMENTARY

Cochlear implantation (CI) in basic words can be defined as the surgical implantation of an electrical device that can stimulate the auditory nerve directly through bypassing a non-functional inner ear. Speech and other sounds can be easily heard by severe to profound deaf people with the help of this device.

This is interesting to mention that in 1961 William House used a surgical approach standard for CI; for more than half a century and there was no major upgradation in the surgical approach. But there were different alternative approaches and some advanced techniques, each of them having relative advantages and disadvantages. The surgical method described by House includes the following steps: Postauricular incision (skin incision) followed by elevation of periosteal flaps or palva flap. After that Mastoidectomy Posterior Tympanotomy Approach (MPTA) was performed. This step constitutes opening of posterior tympanotomy in an inferior direction. Excess bone in front of the facial nerve is removed to obtain good exposure of RW niche and membrane. Care should be taken so that RW membrane may be concealed by a false membrane that is to be removed first by sharp instrument. The next step is to fix the device, by drilling a custom fit bony well for accommodation of titanium case, of the RS (Receiver/ Stimulation) of selected implant.

Next step in classis CI is Cochleostomy, a separate opening is drilled inferior and slightly anterior to RW membrane. The device is brought up to the surgical field, and then the electrode is inserted into the cochlea. Now the stability of device in the well is confirmed and periosteum is sewed together over the implant for further stabilization. The distal end of electrode should be secured by sealing the cochleostomy site. This sealing is helpful in preventing infections from middle ear into cochlea. Simultaneous intraoperative device monitoring is done to confirm both electrical output of device and electrical response of the patient.

For the treatment of Sensorineural Hearing Loss (SHL), Cochlear implantation (CI) has become a familiar method. Progression in the field of signal processing techniques and advancements in the field of microelectronics, over past several decades have led to an improvement in the accomplishing effectiveness of CI devices. To reduce the occurrence of postoperative complications, CI surgery has been upgraded using various techniques. Many patients have successfully gone through cochlear implantation surgery; but still surgery-related complications continue to occur. The potential complications occur with CI are: meningitis, seroma, facial nerve injury (paralysis or paresis), wound infections, eardrum perforation, device extrusion, electrode migration, trauma to the implant site, damage to the receiver-stimulator, acute infection of the middle ear, vertigo, device failure, and mastoid or cholesteatoma in children are the potential complications associated with CI. Based on whether the patient is an adult or belongs to the paediatric age group, the incident of complications varies. However, it is still contended whether specific complications occur more frequently in adult or paediatric patients.

Till date there is no significant change in classic or standard CI. However, some surgical modifications were introduced by the surgeons. The advancements made in CI are described below:

1. The postauricular C-shaped incision was first replaced by inverted J-shaped incision and then modified to endaural incision. But skin breakdown at External Auditory Canal (EAC) and wound infections are the major complications of this type of incision therefore further advancements had been made in endaural incision to lower the risk of infections
2. Periosteal flap elevation is modified so as to ensure good exposure to drilling areas and tight periosteal covering of device. The periosteum is uplifted through two flaps: first one is a short anteriorly based periosteal flap that aims at exposure of mastoid bone, while the second flap is an inferiorly based flap that exposes RS bony well
3. Robotic CI is a new invention to reduce excess bone drilling and getting safe

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and direct excess to RW membrane

4. Although MPTA is a standard approach for CI but now many alternative options are also available including pericanal approach, transattic approach, suprameatal approach, transcanal approach. These approaches aim to avoid the risk of facial nerve surgery and also reduce duration of surgery

Paediatric Auditory Processing Disorders

By Anjali Tripathi*

OPINION ARTICLE

The opinion article "Pediatric Auditory Processing Disorder" presents a mis-shaped perspective on the proof based methodology utilized in medication. The creators centre on the shapeless non-demonstrative element "listening challenges" not sound-related preparing issue (APD) and make disarray that could risk clinical administrations to people with APD. In our point of view article, we invalidate Neijenhuis [1], and all the more significantly, we present a reason for proof put together practice established with respect to the reason that examination on APD is just clinically appropriate when directed on clinical populaces determined to have APD.

WHAT IS AN EVIDENCE-BASED APPROACH TO PAEDIATRIC APD?

The appropriate response is that it is equivalent to for some other sickness or turmoil. As indicated by Sackett [2], the proof based methodology in medication incorporates three components: (a) clinical aptitude, (b) best examination accessible, and (c) the patient's qualities and inclinations. While perceiving the basic job of examination in building up the proof base for confusion, one must not limit the other two columns. While some may be enticed to organize research (even examination with methodological or potentially configuration shortcomings) over clinical aptitude in one's conceptualization of proof based practice, Haynes [3] place clinical skill at the centre of the clinical choice procedure. A key component for a proof based way to deal with APD is that the methodology is educated by research led on clinical populaces determined to have APD [4].

As they would like to think paper, Neijenhuis [1] declare that the three "efficient surveys" they refer to subvert the proof base for APD. Truth be told, none of these papers is really a precise survey of essential, peer-inspected research directed with members determined to have APD. Without distributed orderly audits of members determined to have APD right now, the following best proof based advance is to utilize current expert affiliation rules. European rules allude to numerous nations' rules (inside and past Europe) and these give practically equivalent to and reliable ways to deal with the finding of APD [5]. This methodology isn't similar to the methodologies taken in the papers referred to as orderly APD audits by Neijenhuis [1]. Truth be told, they refer to a survey of clinical practice rules [6], in which the creators utilized an evaluation strategy for rules utilizing the Agree II instrument to rate every rule's logical methodology. Heine and O'Halloran presumed that all accessible APD rules in the English language (counting the American and British Guidelines) scored low in many spaces essentially because of "poor methodological detailing" and ought not to be utilized in their present structure. It ought to be noticed that a precise hunt and assessment of clinical practice rules is anything but an orderly audit of power research, and, in addition, is restricted to clinical preliminaries [7].

The second asserted orderly audit included exploration including members "associated with" as opposed to determine to have APD [8]. The third paper they described as a methodical audit [9] is in reality a report of exploration where correlations were made between a clinical gathering alluded for APD assessment (however not determined to have APD) and a benchmark group of kids. The creators detailed relationships between sound-related handling scores and psychological scores, reasoning that intellectual testing is fundamental in APD conclusion. This is, basically, strange. Discovering connections between these two factors in undiscovered members reveals to us minimal about the utilization of psychological measures in a test battery intended to analyse APD. Any ends made by surveys of APD that incorporate kids associated with APD or determined to have APD based on self-report or witness' report on polls or dependent on youngsters with general listening challenges don't give the best accessible proof clarifying APD. Making determinations dependent on execution of inadequately characterized members presents noteworthy dangers to the legitimacy of the examination. Consequences of any investigation that utilizes the measurement "associated with APD" or "listening challenges" can't be depended upon on the grounds that: (I) One can't be certain whether the members in the examination introduced any sort of evident sound-related shortfall, and (ii) the members may have had a wide scope of unidentified issues [10]. Effective (i.e., touchy and explicit) clinical trial of sound-related handling must be utilized to plainly characterize members and to distinguish and depict known comorbidities with the goal that investigations can be led and results deciphered precisely [11]. The genuine constraints of the associated with APD mark (that isn't a conclusion) is confirmed by the finding that numerous kids alluded for focal sound-related preparing assessments due to "listening troubles" really perform very well on focal sound-related handling measures

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[12,13]. One would expect that on the off chance that parent and educator reports were acceptable indicators of sound-related handling troubles, at that point the APD hit rate (i.e., genuine positives) for these referrals would be a lot higher. Actually there are no distributed, genuine efficient surveys of suitably determined people to have APD. Marking youngsters suspected APD instead of assessing and fittingly diagnosing for APD isn't proof based and is undermining the intercession administrations gave to APD analysed people.

The European Consensus APD Clinical Practice Guidelines are predicated on research like that hidden the ASHA and AAA Guidelines [14,15]. Neijenhuis endeavor to subvert trust in current rules without introducing any other option, proof based methodology for the conclusion of APD. Additionally, they mistakenly attest that APD might be better clarified by other formative issues, including consideration or language-listening deficiencies. This is a supposition/contention that distributed examination has neglected to affirm. Distributed examination shows that a little sub-gathering of APD analysed kids present co-dreary consideration deficiencies [16]. Also, unusual execution on sound-related handling tests frequently happens in spite of supported consideration inside typical cut off points [17]. Truth is told; most sound-related handling tests share just a gentle to direct level of change with perception, driving Weihing [16] to presume that sound-related handling execution isn't driven by cognizance alone. Moreover, development rates for various sound-related undertakings are not connected, as would be normal if a non-tactile factor (e.g., consideration) affected execution [18-21]. Would Neijenhuis attest that a helpless reaction to a sound-related boost (within the sight of ordinary hearing affectability) is because of helpless consideration, however a helpless reaction to a visual improvement must be because of a visual handling shortfall (within the sight of typical fringe vision)? Grounds to contend either case are deficient. Ongoing examination additionally shows that in spite of the fact that consideration is related with how well or inadequately a normally creating youngster utilizes mood to see discourse in prattle, this isn't valid for APD analysed kids [22]. Indeed, of course, there is proof to propose that APD (just as fringe hearing disability) can influence proportions of perception [23,24]. Unmistakably, cerebrum association and handling underlies bidirectional cooperation, just as comorbidity [25].

WHAT IS THE AUDITORY PROCESSING DISEASE CLINICAL REALITY IN EUROPE AND USA?

APD is analysed by fittingly instructed otorhinolaryngologists (ENTs) or potentially audiologists since few would debate that an APD appraisal starts with an intensive evaluation of "fringe" hearing capacity. The diagnosing clinician needs to have a top to bottom comprehension of sound-related capacity and related pathologies, so ENTs/audiologists should be key individuals from any multidisciplinary group, where such social insurance work force are accessible. Be that as it may, we should not dismiss the constrained assets in various nations, where a multidisciplinary approach is supported, yet may not be conceivable inside a proper group setting. Differential conclusion requires multidisciplinary evaluation including discourse language pathologists, instructors, and therapists [26,27]. This far reaching assessment is best practice in APD analysis, just as in figuring individualized intercession. In all cases, examination should control practice, given that the exploration depends on the planned populace of clinical intrigue—that is, people determined to have APD. Sound-related handling tests are assessed for their affectability and particularity before they are utilized for clinical analysis [27-30]. APD clinical finding uncovers the nearness of heterogeneity in the particular sound-related preparing shortfalls found in people determined to have APD. Subsequently, there is a recorded requirement for additional examination in this space actualized in APD analysed people.

An ongoing European APD was intended to bring issues to light of the way that meeting is more than we are right now testing. Rise of a sound-related deficiency presents injurious consequences for language, discernment, learning, and correspondence. We ought not overlook that trial of consideration and memory are regularly directed through the sound-related methodology and might be affected by a conference debilitation-APD included [23,24,31,32]. Sound-related preparing tests remembered for the diagram are the ones utilized usually practically speaking by European clinicians who run claim to fame APD facilities. The data in the infographic depends on a survey finished by individuals from the European APD gathering of 21 nations.

IS THERE PLACE FOR NEW TESTS OR APPROACHES TO APD?

We unquestionably accept that APD determination will advance to incorporate progressively proficient, dependable, and naturally legitimate tests (i.e., tests that reflect ordinary hearing circumstances). One such test might be concealment of otoacoustic emanations utilizing contralateral commotion [33,34]. What's more, electrophysiological methods might be utilized for APD conclusion. For instance, proof of pre-attentional sound-related separation shortfall was accounted for in an ongoing jumble cynicism concentrate in kids determined to have APD [35]. As science and clinical practices advance, be that as it may, it is neither moral, nor down to earth to just reject current clinical skill as detailed in rules of audiology social orders and agreement bunches the world over. There is no proof base for doing as such and subverting clinical administrations for many patients around the globe. Neijenhuis scrutinize the analytic standards for APD on the grounds that there is no particular of the quantity of tests or sorts of tests that are to be utilized although that guarantee is conflicting with Weihing [27] and Musiek [28]. Truth be told, there is no particular number of tests declared for most clinical analyses. Diagnosing an illness or turmoil is a procedure that relies upon side

effects, test discoveries, and examples recognized by the diagnosing clinician. Further, it is an iterative procedure by which clinical theory are figured based on the patient's introduction and afterward affirmed, changed or disposed of based on the scope of discoveries and extra data [36]. This procedure can't be effectively characterized or reproduced based on a severe arrangement of numerical principles and rules: the greater part of the current PC based symptomatic emotionally supportive networks neglect to arrive at master clinician demonstrative exactness levels [37]. It ought to be brought up that developing innovations give promising outcomes in displaying out both audiometry [38] and complex sound-related discernment by methods for computerized reasoning and AI draws near. As of right now, be that as it may, an accomplished clinician is as yet a more exact diagnostician than a machine. Rising advances increase the executives and treatment of sound-related shortages also.

IS THE NEIJENHUIS ET AL. FEELING ARTICLE ABOUT APD?

We would contend it isn't. It centres on research utilizing non-analysed members bearing the undefined, non-symptomatic marks "associated with" or 'listening challenges.'

WHAT DOES THE EVIDENCE-BASED APPROACH TO APD DEMAND?

We should convey the most productive (touchy and explicit) accessible test batteries to analyze and design mediation for people with APD to limit the unfriendly effects the confusion is causing for correspondence, training, social coordination, and work/occupations. APD ought to be considered inside develop of hearing weakness and ought to be overseen dependent on analysed shortfalls in focal sound-related preparing.

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