Asia Pacific Journal of Research

ISSN (Print): 2320-5504
ISSN (Online): 2347-4793

Asia Pacific Journal of Research
A peer reviewed international Journal
IMPACT FACTOR : 6.58
Print -ISSN -2320 - 5504
Online-E-ISSN - 2347 - 4793
University Grants Commission
Approved Journal S.N.45797

A STUDY OF CHANGE IN NASALANCE SCORES - PRE FITTING AND POST FITTING OF HEARING AIDS IN ADULTS WITH SENSORINEURAL HEARING LOSS

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ABSTRACT

Background: Nasality is a common resonance error present in the speech of HI individuals that contributes to reduced speech intelligibility. The aim of the study is to find out the nasalance scores at pre and post aided conditions and compare the result to know the effect of usage of hearing aids on nasalance.

Material and methods: 60 subjects within the age range of 30 to 60 years with post lingual bilateral sensory neural hearing loss were taken. Participants were asked to read Oral, Nasal and Phonetically Balanced passage. Nasalance score of the passages was recorded using Nasometer II (Kay PENTAX), in both pre-aided and post-aided condition.post-aided recording was done after three months of usage of hearing aid.

Result: Descriptive statistical were done to obtain the mean and standard deviation of the nasal scores. The mean nasalance score of Oral passage, Nasal passage and Phonetically Balanced passage were (X± SD= 24.2± 6.9, 49.6± 10.8; and 35.4 ±7.4 respectively) in pre-aided condition and (X± SD= 18.7± 6.5, 39.1 ± 10.29 and 28.5 ±7.3 respectively) in post-aided condition. There is a Significant difference (p= 0.001) between the pre-aided and post-aided nasalance score.

Conclusion: The obtained nasalance data yielded significantly lower nasalance scores in the post aided condition for the three reading passages. This suggests that velopharyngeal closure is more accurate when auditory feedback, and other sensory information, is increased. We can assume that the use of auditory feedback as a strategy to improve velopharyngeal function in patients with velopharyngeal disorders must be encouraged.

Keywords- *Nasalance, Hearing loss, Hearing aid, Passages, velopharyngeal function*

INTRODUCTION

Hearing impairment is considered the most commonly reported sensory deficit in the human population, and it is well-known to have significant effects on the speech outcomes of the hearing impaired speaker (Salvinelli, Casale, Trivelli, & Greco, 2002). The most commonly perceived articulatory problems in those patients include omission or distortion of initial or final consonants, voiced-voiceless errors, nasalization, substitution of one consonant with another, and intrusive voicing between neighbouring consonants (Kirk & Pisoni, 1997). Many factors affect the speech in hearing-impaired (HI) individuals. The age at onset of hearing loss, course of the hearing loss (progressive or static), type and degree, and use of hearing aids are all among factors that affect the degree of the speech intelligibility problem. This difficulty in oral communication affects the speech intelligibility of a hearing-impaired individual (Scherer, 1986). Abnormal nasalization of vowels and nasal consonants is considered one of the most prevalent speech abnormality that significantly contributes to the unintelligibility of the hearing impaired speakers (Chen, 1995). High values of nasal resonance are perceived as hypernasality to the listener.

ISSN (Print): 2320-5504
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There is a considerable body of research suggesting that individuals with HI speakers more slowly than normal hearing speakers (Boone, 1966; Colton & Cooker, 1968; Fletcher & Daly, 1976; Fletcher, Mahfuzh, & Hendarmin, 1999; Hood & Dixon, 1969; John & Howarth, 1965; Nickerson, 1975; Robb, Hughes, & Frese, 1985; Voelker, 1938). In addition, within the population of HI speakers, it has been shown that individuals with a severe HI speak at a slower rate compared to mild to moderate HI individuals (Boone, 1966; Hudgins, 1934; Hudgins & Numbers, 1942; Robb et al., 1985). Hood and Dixon (1969) observed that the most pronounced difference between that of the HI and normal individuals they studied was speaking rate. The HI speakers took at least 1.5 times longer to produce a variety of stimulus sentences. Their results also indicated that the speech rhythm of the HI individuals was significantly related to speech intelligibility, thereby suggesting that speech intelligibility could be enhanced if speaking rate and rhythm were improved.

Nasality is a common resonance error present in the speech of HI individuals that contributes to reduced speech intelligibility (Hudgins, 1934; Hudgins & Numbers, 1942). Inadequate timing aspects of speech (i.e., speaking rate & rhythm) have been found to contribute to diminished intelligibility in the speech of HI individuals (Hood & Dixon, 1969; Hudgins, 1934; Hudgins & Numbers, 1942; John & Howarth, 1965; McHenry, 1999; Wilson & McReynolds, 1973). John and Howarth (1965) found that intelligibility improved when HI children were trained to focus on the speech patterns (rhythm & stress) of their utterances. Another disorder that is characterised by excessively nasal speech is that of hearing impairment (HI) (Colton & Cooker, 1968; Fletcher & Daly, 1976; Hudgins, 1934; Penn, 1955; Seaver et al., (1980).

Hypernasality, in varying degrees, is one of many characteristics of the speech of HI individuals that contributes to reduced speech intelligibility. Others include breathy speech, irregular rhythm and speaking rate due to the insertion of syllables and prolonged pauses, unusual grouping of phonemes, prolonged vowels, and the incorrect use of adjoining consonants (Boone, 1966; Hood & Dixon, 1969; Hudgins, 1934; Hudgins & Numbers, 1942; John & Howarth, 1965; McHenry, 1999; Voelker, 1938). McClumpha (1969) noted that HI speakers took considerably longer to repeat syllable sets compared to normal hearing speakers. She concluded that the nasality present in the speech of the HI group may be influenced by their rate of speech.

Resonance disorder, especially hypernasality, is a common speech problem of the deaf adults and children (LaPine, Stewart and Tatchell, 1991). However, the mechanism of this abnormal nasal resonance is poorly understood. The excessive nasal resonance reported in deaf and hard-of-hearing subjects is related mainly to the poor control of the velopharyngeal valve because of the absence of auditory feedback (Fletcher, 1999).

Ysunza and Vazquez, (1993) reported the absence of any structural or neuromuscular abnormalities of velopharyngeal anatomy on nasopharyngoscopy, fluoroscopy, and electromyography, but they noted that velopharyngeal activity lacked rhythm and strength in hearing-impaired children with abnormal nasal resonance.

Lapine et al., (1991, 1992) and Tatcell et al., (1991) investigated the nasalance differences in hearing impaired children in device-on-off experiments. From the reported studies, it was concluded that nasalance scores of participants with hearing loss were not significantly different between the device-on and device-off condition, because of the retained neuromuscular control of the velopharyngeal mechanism during a short term reduction of auditory feedback. Hearing seemed to play a critical role in providing feedback about palatal function.

However, Skolnick & Cohn (1989) further cited that as participants with hearing loss are not able to "feel" the position of the velum during ongoing speech production, they must rely upon auditory feedback to achieve an oronasal resonance balance for normal speech production.

Researchers who have completed previous studies on the speech problems of HI individuals have discovered that cochlear implantation has a positive influence in the recipients' lives by helping them to overcome their hearing loss through improvements in auditory feedback. Speakers with hearing impairment are another group that may exhibit hyper-nasal speech which is most probably due to a lack of auditory feedback (Nguyen, Allegro, Low, Papsin, & Campisi, 2008). Among the hearing impaired, the lack of auditory feedback can also produce hyponasal speech, because the speakers overcompensate by constantly closing the velopharyngeal mechanism during speech (Kim et al., 2012).

A further distinction is the lack of auditory feedback available to hearing impaired individuals (Hudgins & Numbers, 1942; Seaver et al., 1980; Stevens, Nickerson, Boothroyd, & Rollins, 1976; Zimmerman & Rettaliata, 1981). Without auditory feedback, an individual may not learn the motor routines needed to separate the oral and nasal cavities; the nasality present in the speech of hearing impaired individuals is noticeable to the everyday listener. This resonance disorder contributes to reduced intelligibility (Higgins, Carney, & Schulte, 1994; Hudgins & Numbers, 1942). The study aimed to find the relationship of nasalance score with use of hearing aids.

Nasality refers to the lowering of the velum during vowels or other oral continuants. When the velum lowers during vowels, the velopharyngeal port is opened, and there is acoustic coupling between the nasal cavity and the main vocal tract, giving rise to a distinct acoustic quality which we call nasality (Chafcouloff & Marchal, 1999). Nasality is a common resonance disorder present in the speech of severely hearing impaired individuals (Hudgins, 1934). The likely cause has been attributed to structural or functional abnormalities of the velopharyngeal mechanism as well as deviations in pitch and loudness.

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Hearing impaired participants demonstrate deviant vocal behaviours. In addition, hearing impaired individuals speak at a slower rate than normal hearing individuals which has been shown to exacerbate the presence of nasality in their speech (Colton & Cooker, 1968).

Higher nasalance score occur in hearing impaired participants because lack of auditory feedback. The importance of auditory feedback is well known. First, it plays a major role in different aspects of voice production (e.g. respiratory problems, loudness of voice, voice pitch and resonance) (Boone & McFarlane, 1994). Secondly, auditory feedback is being used as a therapeutic strategy in the treatment of velopharyngeal disorders. Use of hearing aid influences nasalance in hearing impaired participants.

The objectives of the study are to Find out the nasalance score at pre-aided condition (period before the actual fitting of the hearing aid) and then measure nasalance score at aided condition for different types of hearing aid users (after a three months period with regular use of a hearing aid). And lastly compare the nasalance scores of participants with hearing impairment in the pre-aided and post aided conditions and the effect of usage of hearing aids on nasalance in adults with hearing impairment.

MATERIAL AND METHODS

A total number of 60 adults (22 female and 38 male) with post lingual bilateral sensory neural hearing loss were included in this study. The age range of the participants was 30-60 years. Gender equality was not considered in the study.

The participants included in the study were adults between age ranges of 30-60 years and diagnosed as post lingual bilateral sensory neural hearing loss. All the participants were considered and accepted to wear hearing aid continuously, for at least a minimum duration of 3 months (first time users).

Participants with a history of conductive or mixed hearing loss and such as neurological, craniofacial syndrome, vestibular disorder, velopharyngeal impairment or rhinological dysfunction were excluded from the study.

Test tools:

Nasometer

The model 6400 Nasometer II, (Kay PENTAX) was used as the recording instrument. The Nasometer is a microcomputer–based system that provides the user with a numeric output indicating the relative amount of nasal acoustic energy in a participant's speech. With this device, oral and nasal acoustic signals are sensed by microphones on either side of a sound separator plate that rests on the upper lip. The signal from each of the microphones is filtered and digitized by custom electronic components and then processed by the computer and accompanying software. The resultant signal is a ratio of nasal to plus- oral (total) acoustic energy that is multiplied by 100 and expressed as a "nasalance" value (Instruction Manual, Kay Elemetrics Corp., Pine Brook, NJ; Seaver et al., 1991).

Passage stimuli-

A set of three passages developed and standardized in Bengali by Kumar, Chakrabarthy, Shailat and Singh.,(2012) for nasalance measurement was used for the purpose of the study. The first passage was the Oral passage which excluded nasal consonants. The second passage was the Nasal passage that contained 30% of nasal consonants that is three times greater than that in the Phonetically Balanced passage. The third passage was the Phonetically Balanced passage that contained approximately 10% of nasal consonants. The Bengali passages are given in Appendix – I & II.

Procedure-

Instructions:-The participants were asked to read the three passages which were developed and standardized in Bengali by Kumar, Chakrabarthy, Shailat and Singh (2012). The participants were instructed to start reading after the recording icon was clicked. Nasalance measure was taken first for oral passage followed by nasal passage and then phonetically balanced passage. The participants were instructed not to repeat a syllable once spoken, and also not to add filters like /umm/ or /aaa/ in between reading from where they stopped. The participants were instructed to perform each reading task at comfortable vocal pitch and loudness level. If the participants made a reading error, they were asked to repeat the passage. The participants were seated in front of a computer monitor and asked to read the Bengali passages. These instructions were given in pre hearing aid fitting and post hearing aid fitting (The Participants were instructed to come after 3months of continuous use of hearing aid).

Recording of data-

The model 6400 Nasometer II (KayPENTAX), a microcomputer-based system, was used for data collection. Before initiating data collection, the Nasometer was calibrated in a sound- treated room following the procedures outlined in the manual (Kay Elemetrics, 1994). The position of the Nasometer headset was adjusted and secured in accordance with the manufacturer's specifications. The headset is made of a harness that holds a nasal/ oral separation plate and two microphones.

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The directional microphones mounted on either side of the separation plate collect the separated nasal and oral acoustical signals. The separation plate provides about 25dB separation between the nasal and oral signals. The Nasometer headpiece was then positioned such that the oral and nasal microphone at equal distances from the mouth and nose. The data collections were taken for oral passage, nasal passage and then for phonetically passage in pre-aided condition. The participants were recalled after three months usage of hearing aid and data was collected for oral passage, nasal passage and then phonetically balanced passage.

Scoring-

The subjects were given to read the Oral passage, Nasal passage and then Phonetically Balanced passage and their nasalance scores on the three passages were recorded. Mean score of Oral passage, Nasal passage and Phonetically Balanced passage was collected from Nasometer in the pre-aided and post aided condition after 3 months of hearing aid use.

Statistical analysis

The raw data was tabulated and analysed using the SPSS (17.0 version) and Descriptive statistics were done to obtain the mean and standard deviation of the nasal scores. Paired sample t-test was used to obtain the significance difference within the group scores.

RESULTS

Descriptive analysis was done to have a concomitant result of the proportion of participants disseminated with the degree of hearing loss and the type of hearing aid usage and its effect on the nasalance. Nasalance scores were compared between the pre-aided and aided conditions of Oral passage, Nasal passage and Phonetically Balanced passages. Mean and SD of nasalance scores were measured. Results from the Paired sample t test were calculated.

Descriptive analysis:

The frequency analysis portrays that there were 22 female and 38 male participants. There were 8, 12, 15, 18 and 7 participants with mild, moderate, moderately severe and profound sensory neural hearing loss respectively and are represented in the *table 1*.

Table 1. Depicts the frequency distribution of hearing loss amongst the participants.

Degree of hearing loss	Frequency distribution of hearing loss.			
	Male	Female	Total	Valid Cumulative percentage
Mild SNHL	6	2	8	13.3
Moderate SNHL	11	1	12	20.0
Moderately severe SNHL	6	9	15	25.0
Severe SNHL	11	7	18	30.0
Profound SNHL	4	3	7	11.7
Total	38	22	60	100.0

Nasalance score of participants at pre-aided condition:

The nasalance scores obtained before the actual fitting of hearing aid (pre-aided condition) for Oral passage, Nasal passage and Phonetically Balanced passage is depicted in the *Figure 1.*

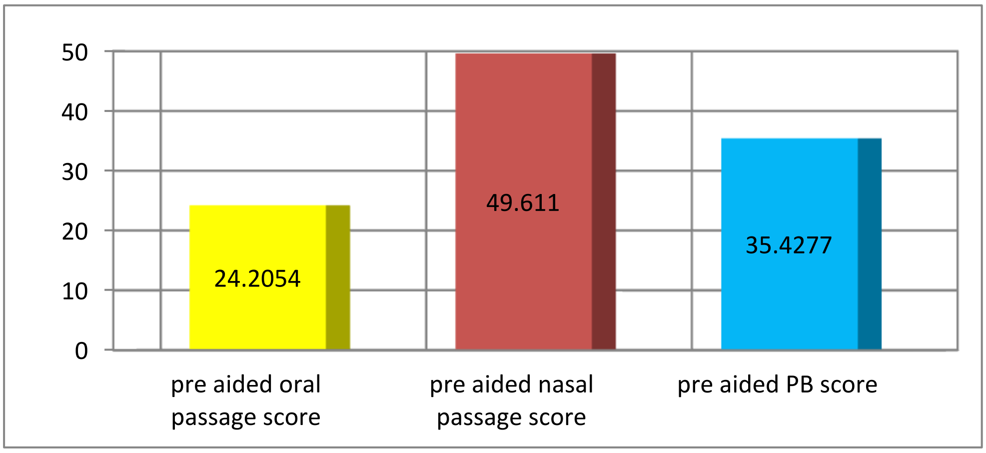

Figure 1: The mean nasalance score of participants at pre aided condition.

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The *Figure 1* depicts that the mean nasalance score of Oral passage, Nasal passage and Phonetically Balanced passage were (X± SD= 24.2± 6.9, 49.6± 10.8; and 35.4 ±7.4 respectively) in pre-aided condition.

The frequency analysis on type of hearing aids describes that of 60 participants 11, 10, 29, and 10 participants were wearing mild, moderate, strong class body level hearing aids and BTE analogue hearing aids respectively and are represented in the table 2 individually.

Table 2. Depicts the type of hearing aids used amongst the participants.

Type of hearing aids	Frequency of distribution of hearing aids			Valid cumulative Percent
	Total	Female	Male	
Mild class body level hearing aids	11	3	8	18.3
Moderate class body level hearing aids	10	0	10	16.7
Strong class body level hearing aids	29	19	10	48.3
BTE analog hearing aid	10	0	10	16.7
Total	60	22	38	100.0

Nasalance score of participants at post aided condition:

The nasalance score for Oral passage, Nasal passage and Phonetically Balanced passage of aided condition for different types of hearing aid preferred is depicted in the *Figure 2*.

Non- Parametric Chi- Square test was done to find out the significant difference between mild class, moderate class, strong class and BTE hearing aids across aided Oral, aided Nasal and Aided Phonetically Balanced nasalance score. Chi-Square statistical test results depicted that there was no significant difference in mild class hearing aids (p=0.07), moderate class hearing aids (p=0.09), strong class hearing aids (p=1) and BTE hearing aids (p=1) across aided Oral, aided Nasal and aided Phonetically Balanced passages.

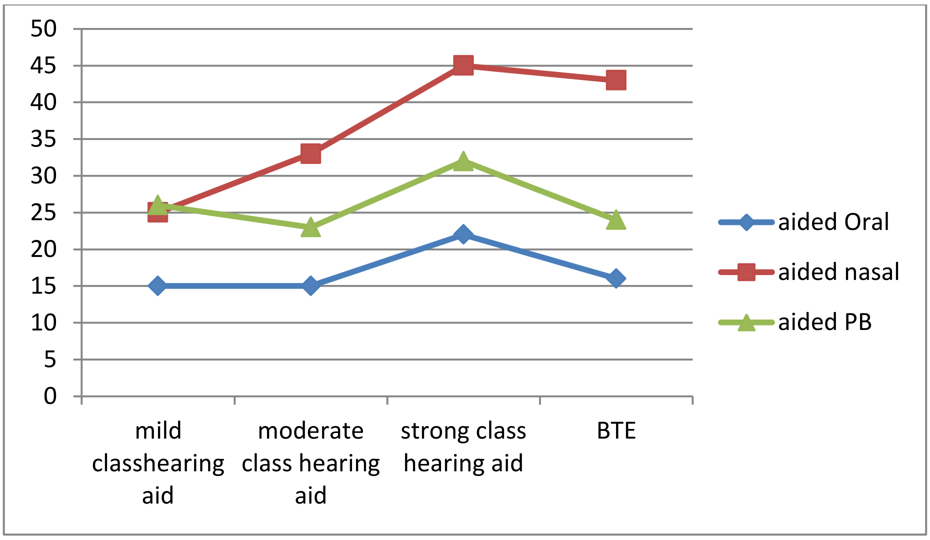

Figure 2: Nasalance score of participants at aided condition with respect to the types of hearing aids.

The nasalance score for Oral passage, Nasal passage and Phonetically Balanced passage at post aided condition i.e., scores obtained after fitting and three months regular use of a hearing aid is depicted in the *Figure 3*.

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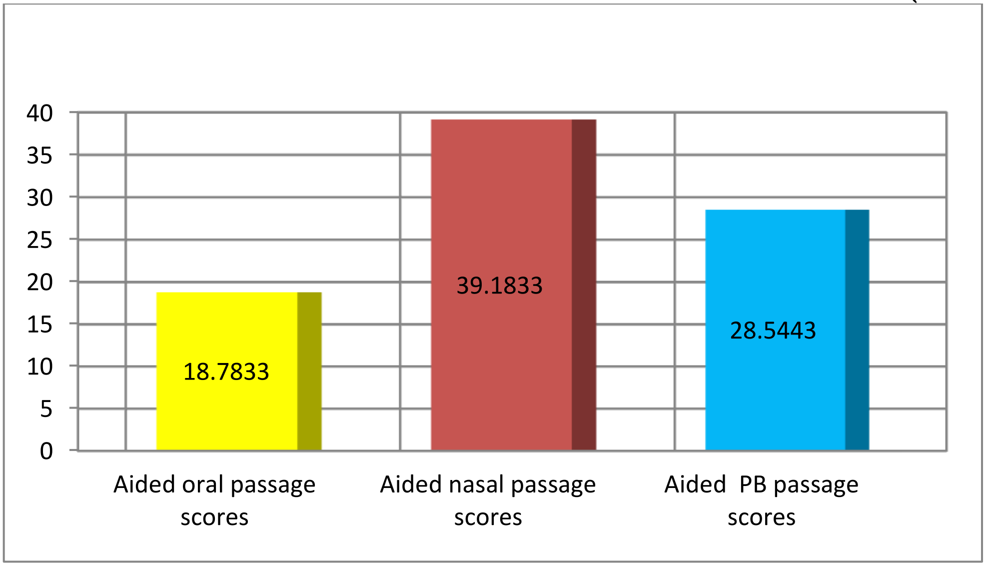

Figure 3: The mean nasalance score of participants at post aided condition.

The F*igure 3* depicts that the mean (X± SD) nasalance score of Oral passage, Nasal passage and Phonetically Balanced passage were 18.7± 6.5, 39.1 ± 10.29 and 28.5 ±7.3 respectively in the aided condition.

Comparison of nasalance scores of participants at pre-aided and post aided conditions:

The nasalance score of hearing impaired participants at pre-aided condition was higher, compared to aided condition. However, to know if there existed a significant difference between the two scenarios, a paired sample t-test was done. Nasalance score of participants with different degree of hearing loss at pre aided and post aided conditions for the three passages is depicted in the *Figure 4.*

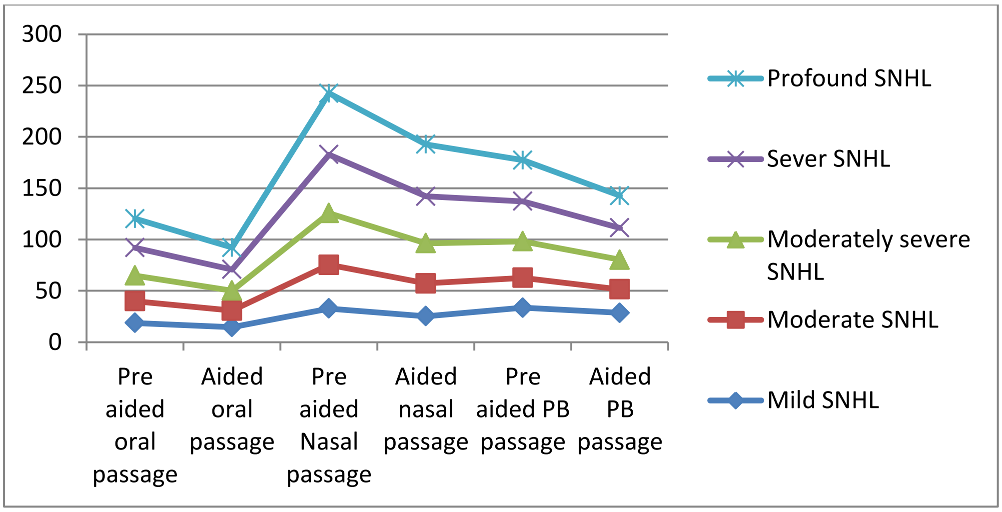

Figure 4: The nasalance score of participants at pre aided and post aided conditions for the three passages for degree of hearing loss.

The nasalance score of participants with hearing impairment at pre-aided and post aided states were compared and depicted in the table 3.

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Table 3. Depicts that there is a difference between the pre aided and post aided conditions of the participants.

	Score	Standard mean error	Sig.
Pair 1	Pre-aided and aided oral score	0.29582	0.001
Pair 2	Pre-aided and aided nasal score	0.51284	0.001
Pair 3	Pre-aided and aided Phonetically Balanced	.49977	0.001

The table showed that there is a significance difference (p= 0.001) between the pre- aided and post aided nasalance score.

Thus the result illustrates the hypothesis and concludes that

i) There is a significant difference in the nasalance scores between pre and post fitting period in first time users of hearing aid and

ii) Nasalance in speech reduces after the 3 months use of hearing aids.

DISCUSSION

The present study investigates the nasalance scores of post lingual hearing impaired individuals before hearing aid fitting and after three months use of hearing aid. The nasalance scores tend to be high in post lingual hearing impaired person (Fletcher & Daly, 1976; Lapine et al., 1991), & this is due to significant change in the auditory feedback (Lapine et al. 1991) which leads to abnormal nasal-oral coupling during speech production (Fletcher, 1973; Tatcell et al. 1991). This study involves in finding out if there is any decrease in nasalance score after consistent use of hearing aid for three months as, it is a proved fact that use of hearing aids to increase the efficacy of auditory feedback mechanism. The hearing aid if constantly worn would makeshift in nasalance effects, as the position of the velum is not monitored during ongoing speech production thus one have to rely upon auditory feedback to achieve an oro-nasal resonance balance for normal speech production (Skolnick & Cohn, 1989). The nasalance study results comprising of 22 females and 38 females with population ratio of 13: 20: 25: 12 having mild, moderate, moderately severe, severe and profound sensorineural hearing loss respectively is in congruence with the study statements depicting that there is a decrease in nasalance scores after 3 months of hearing aid use with a significant difference in the nasalance score of participants between the pre aided and aided conditions.

Nasalance score of participants at pre-aided conditions:

The mean nasalance score of participants at pre aided condition for Oral and Nasal passage were 24.2 and 49.61 respectively (depicted in Figure 2). These score compared to the normative scores in Bengali (2012) and in English (Bressmann. T, 2005) were high in Oral and Nasal passages. The study results are in congruence with the reports of Van Lierde et al, (2001); Fletcher, (1930) and others who stated that hyper nasality is the common speech problem in children and adults with hearing impairment. This may be due to the fact that velopharyngeal activity lacked rhythm and strength in hearing-impaired children leading to abnormal nasal resonance (Ysunza & Vazquez, 1993). The mean nasalance score of participants at pre aided condition for phonetically balanced passage were 35.42 as depicted in Figure 4. This score however equalizes the normative scores in Bengali but is significantly low when compared to the English normative scores set by Bressmann, T. (2005). This may be owing to the fact that the hearing impaired persons can also produce hypo nasal speech because the speakers over compensate by constantly closing the velo-pharyngeal mechanism due to lack of auditory feedback (Kim et al, 2012). Thus it can be stated that lack of coordination is suggested to be reflected on the overall timing of articulatory events, in the hearing-impaired than in normal hearing subjects, thus contributing to the change in nasal resonance of their speech (McGarr et al., 1987).

Nasalance score of participants post aided condition:

The mean nasalance score of participants post aided condition for Oral and Nasal passage were 18.78, 39.18 respectively (depicted in Figure 4). These scores were same as compared to the normative scores in Bengali (2012) and in English (Bressmann. T, 2005). The study results are in correspondence with the reports of Van Lierde et al, (2001) and evidently prove that hearing aids have a significant effect on speech in post lingual hearing impaired persons including the nasalance. The results are in analogy with the statements that nasalance depend upon the auditory and kinaesthetic feedback (Chen, 1995). If is there is an increase in the auditory feedback this would result in lesser demand to concentrate on the length of the sentence spoken which increases the kinaesthetic feedback and simultaneously reduces the nasal oral coupling (Fletcher, 1973; Hutchingson et al, 1978).

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ISSN (Online): 2347-4793

The mean nasalance score of participants post aided condition for Phonetically Balanced passage were 28.54 as depicted in Figure 6. This score however were low to the normative scores in Bengali (2012) and English (Bressmann, T. 2005). These results may not be generalized but may be justified as stated by Van Lierde et al, (2001) and Suman. K et al, (2012) that speech programming differences, results in nasal coarticulation thus influencing the nasalance score.

In the figure 3 it has been depicted that the nasalance scores of participants using mild, moderate, strong and BTE hearing aids for Phonetically Balanced passage, Oral and Nasal passages after three months of hearing aid fitting are in congruence. This depicts that irrespective of the types of hearing aids the nasalance score patterns are consistent among the participants. This may be owing to the factor that 43% of hearing impaired person with sensory neural hearing loss has the excessive nasal voice irrespective of any type of hearing aid (Fletcher and Dally, 1976). The study thus is in congruence with the study of Colton and Cooker (1968) and Bzoch (1965) which stated that the excessive nasality is present in person with hearing impairment due to reduced tempo. They further stated that a slow, one-word-at-a-time tempo, even in normal speakers was judged to be more nasal than when they spoke at their normal rate and increase in auditory feedback increases the tempo of the person with hearing impairment leading to similar momentary interruptions in palatal contact with the pharyngeal wall during pauses in speech by normal speakers. Thus it can be concluded that the increase in auditory feedback can result in the better nasalance score irrespective of type of hearing aid used.

Comparison of nasalance score at pre-aided and post-aided conditions:

Significant differences in nasalance scores were found between the pre-aided and post- aided condition as shown in figure 5 and table 3. The obtained nasalance data yielded significantly lower nasalance scores in the post aided condition for the three reading passages. This suggests that velopharyngeal closure is more accurate when auditory feedback, and possibly other sensory information, is increased. From this point of view, we can assume that the use of auditory feedback as a strategy to improve velopharyngeal function in patients with velopharyngeal disorders must be encouraged.

CONCLUSION

The study is an attempt to add on a note on the lack of basic information on the impact of hearing impairment and hearing aid use on nasalance scores. The study depicts there is high nasalance record in adults with post lingual hearing impairment. However, if the participants tend to use the hearing aid continuously for a period of three months there is a significant decrease of the nasalance score irrespective of the degree of hearing loss, age and type of hearing aid usage.

The results suggest that the auditory feedback plays an important role in the oral manifestation associated primarily with velopharyngeal closure. Velopharyngeal closure is more accurate when auditory feedback, and possibly other sensory information, is increased. Thus the use of auditory feedback as a strategy to improve velopharyngeal function in patients with velopharyngeal disorder is recommended.

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APPENDIX

Oral Passage

কাল বাড়ি যাচ্ছি। সকাল সকাল বাস ধরব। বারটা একটার কাছাকাছি বাড়ি ঢুকে যাব। পৃথাকে বলে রেখেছি ঝোল ভাত করে রাখতে। দুপুরে খেয়ে চাষের কাজ দেখতে যাব আর যদি পারি বুড়ীর শ্বশুরকে দেখে আসব। বুধবার ফিরে কাজে যাব। বস্ বড্ড রাগী। একটু দেরি, হুট হাট ছুটি অথবা কাজে ভুল হলে খুব রাগ করে।

Nasal Passage

মা, তুলি, টিয়াকে মনসার নাম মনে মনে স্মরণ করতে বললেন এবং মনের মলিন মেঘ শূন্য মান ম্লান করার জন্য নানান বচন শোনালেন।

Phonetically Balanced Passage

চন্দ্রিমা এক দৃষ্টিতে তাকিয়ে ছিল পৃথিবীর পানে। আকাশের বুকে মেঘের কোলে, অতি স্নেহে ও যত্নে বেড়ে উঠেছে চন্দ্রিমা। যদিও ভোরের সঙ্গে তার বনিবনা বহুকাল লুপ্ত। তারা হল প্রানের সখী। তাকেই জানিয়েছে সে তার গোপন প্রণয় কথা। তাই ঝরনা যখন চোখ ফেরায় সাগরের দিকে বা গোধূলি মেলে ধরে এক ঢাল আলোর রেশ, ডুকরে কাঁদে হৃদয়। টোটো, লালা, জোনাকি, পবন, তিতাস হংস, স্মিতা ও মন সব্বাই ওদের শুভ মিলনের সাক্ষী।