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| December 2020 | Volume 6 | Issue 1 |

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ISSN 2470-4059

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ISSN 2470-4059

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Brief Research Report

Awareness of Ototoxicity among Medical Doctors in Assam

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Article information
Received: February 11th, 2020; **Revised:** March 3rd, 2020; **Accepted:** March 16th, 2020; **Published:** March 21st, 2020

Cite this article
Bora W, Sanju HK, Kumar V, Borah P, Jain T. Awareness of ototoxicity among medical doctors in Assam. *Otolaryngol Open J*. 2020; 6(1): 1-4.
doi: 10.17140/OTLOJ-6-159

ABSTRACT

Introduction
Previous literature has reported ill-effect of ototoxic drug on hearing and balance. Present study investigated awareness among medical doctors for the same.

Method
A total of 55-medical doctors of multiple specialties from Assam, India participated in the present study. A total of 14 questions with Likert Scale based scoring pattern were framed and validated for the present study.

Results
Outcome of the present study showed high awareness percentage about side effect ototoxic drugs was obtained, which was a satisfying outcome.

Conclusion
While low audiological referral and consultation awareness was identified as an area of concern.

Keywords
Ototoxicity; Doctors; Assam; Awareness.

INTRODUCTION

Ototoxicity is defined as the tendency of certain medicine to cause functional injury and cellular degeneration of tissues of the inner ear and vestibular nerve. Most medical doctors prescribe certain medicines to the patients during treatment, which upon consumption may cause temporary or permanent hearing loss in patients. These medicines are known as ototoxic medications and cause ototoxicity.[1] Currently, there are no therapies for the prevention or treatment of ototoxicity that the Food and Drug Administration (FDA) has approved.[2] The World Health Organization (WHO) has identified ototoxicity as one of the main preventable causes of deafness and an outcome that can be most directly influenced by healthcare professionals.[3] Previous literature has well reported the ill-effect of ototoxic drugs on hearing.[2,4-7] The present study has been undertaken to evaluate the level of awareness about ototoxicity among the Doctors in Assam (North-east India). The primary objective of this study was to identify the level of awareness on ototoxicity among the Doctors of Assam. Additionally, this study was designed to know and quantify audiological referral and consultation in case of ototoxicity.

MATERIALS AND METHOD

A total of 55-Doctors of multiple specialties from Assam (North-east India) participated in this study. Out of 55, seven were under graduate and 48 were post graduate medical professionals. Oral and written consent were taken from all participants participated in the study. The study was approved by the ethics committee of Shri Jagdamba Charitable Eye Hospital, Sri Ganganagar, Rajasthan, India. The mean years of experience was m=27.01±10.3-years of various disciplines of medical practice. A total of 14 multiple choice questions were framed and validated for the present study. More than 95% of content validity and test-retest reliability was

fixed for stimuli selection. All the 14 questions were analyzed for primary objective while question number 11, 12, 13 were analyzed for secondary objective of the study.

Purposive sampling was used to conduct survey-based research.Likert Scale based scoring pattern was used where response was distributed among 5 categories: strongly agree, somewhat agree, neutral, somewhat disagree, strongly disagree. The participants were contacted over phone and through e-mails and consent were obtained for response to the questionnaire which was sent through e-mail. Auto termination of this e-mail was fixed for 15-days.12.8% responses were obtained within a day, 72.7% of responses were obtained within a week, and rest of the responses were obtained from 7 to 15-days.

Responses of each participant were coded, arranged and analysed in Statistical Package for the Social Sciences (SPSS) 21. Descriptive statistical methods were used to analyse the data. Response across each question were analysed separately.

RESULTS AND DISCUSSION

The responses from the questions were analysed and percentage was calculated. For the questions on ototoxicity, 82% of doctors in Northeast India strongly agreed that certain medications can damage the ear, resulting in hearing loss. Eighteen percent (18%) of the doctors somewhat agreed to it (Figure 1). Seventy percent (70%) of doctors strongly agreed that certain medications can damage the ear, resulting in ringing sensation in the ear. Thirty percent (30%) of doctors somewhat agreed to this statement (Figure 2). Only 55% of the doctors strongly agreed that certain medications can damage the ear, resulting in balance disorders. Thirty-seven percent (37%) of the doctors somewhat agreed on this. Seven percent (7%) of the doctors were neutral on this statement (Figure 3). Ninety-three percent (93%) of the doctors strongly agreed that they are familiar with the term ototoxicity. Three percent (3%) of the doctors somewhat agreed. Two percent (2%) of doctors were neutral on their familiarity with the term and the remaining 2% somewhat agreed (Figure 4). Forty-two percent (42%) of the doctors in Northeast strongly agreed that that they were aware that there are more than 200 ototoxic drugs that are sold by the pharmaceutical companies in the market. Thirty-five percent (35%) of the doctors somewhat agreed that they were aware. Eighteen percent (18%) of the doctors were neutral about their awareness on this matter. Five percent (5%) of the doctors somewhat disagreed. On questions regarding the intervention for the patients, only 60% of the doctors strongly agreed that when a decision is made to treat a serious illness or medical condition with an ototoxic drug, the effects of the medications on the hearing and balance systems and their side effects are discussed with the patient (Figure 5). Twenty-nine percent (29%) of the of the doctors somewhat agreed. Five percent (5%) of the doctors were neutral on this matter. Another 5% of the doctors the doctors somewhat disagreed on this practice. The remaining 5% of the doctors strongly disagreed. Seventy percent (70%) of the doctors strongly agreed that if a patient is treated with ototoxic medications, it may cause damage to the sensory cells used in hearing and balance. Twenty-five percent (25%) of the doctors somewhat agree on this practice. The remaining 5% were neutral on this matter (Figure 6). Forty-five percent (45%) of the doctors strongly agreed that they were aware that aminoglycoside antibiotics, such as gentamicin are medications known to cause permanent hearing loss. Forty-one percent (41%) of the doctors somewhat agreed to it. Nine percent (9%) of them were neutral on this matter. The remaining 3% of the doctors somewhat disagree (Figure 7). Interestingly, only 38% of the doctors in Northeast strongly agreed that they were aware that cancer chemotherapy drugs, such as cisplatin and carboplatin are known to cause permanent hearing loss. Forty-eight percent (48%) of the doctors somewhat agreed on their awareness. Eleven percent (11%) of the doctors were neutral regarding this fact and the remaining 3% of the doctors somewhat disagreed (Figure 8). Fifty-four percent (54%) of the doctors strongly agreed that they are aware that pain relievers (aspirin), quinine and loop diuretics are known to cause temporary hearing loss. Thirty-nine percent (39%) of the doctors somewhat agreed to it. The remaining 7% were neutral on this matter. Only 37% of the doctors strongly agreed that the patients in the who are prescribed with ototoxic drugs are referred for a baseline record of hearing and balance to be recorded by an audiologist (which includes an audiologic hearing test that uses high-pitched testing, word recognition and other tests, which helps to decide whether to change or stop the medication). Twenty-four percent (24%) of the doctors somewhat agreed to this practice. Another 24% were neutral regarding this matter. Eleven percent (11%) of the doctors somewhat disagreed and 4% strongly

Figure 1. *Response of the Question Regarding "Certain Medication can Damage the Ear, Resulting in Hearing Loss"*

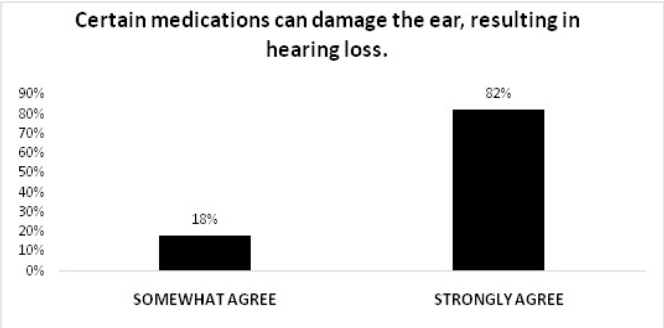


Figure 2. *Response of the Question Regarding Certain Medication can Cause Tinnitus*

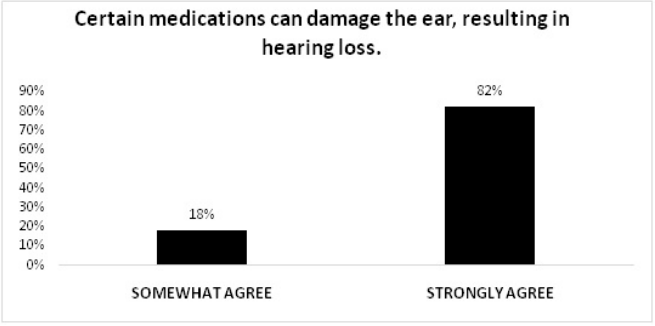


Figure 3. *Response of the Question Regarding Balance Problem after Intake of Certain Medication*

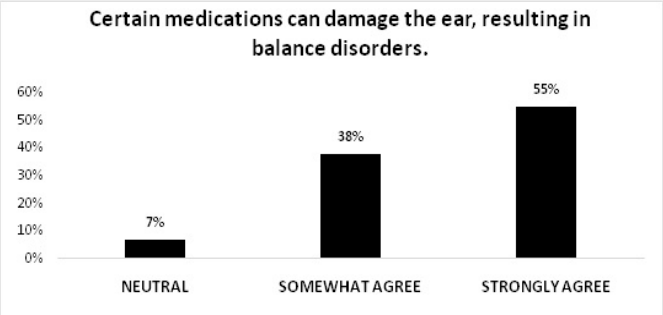


Figure 4. *Familiarization with the Term "Ototoxicity"*

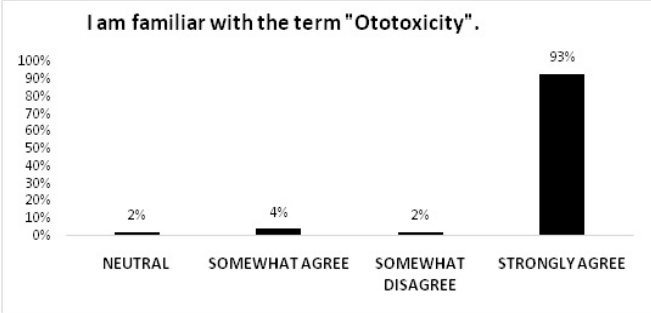


Figure 5. *Response Regarding Side Effect of Ototoxic Drug Need to be Discussed with the Patient before Prescribing Them*

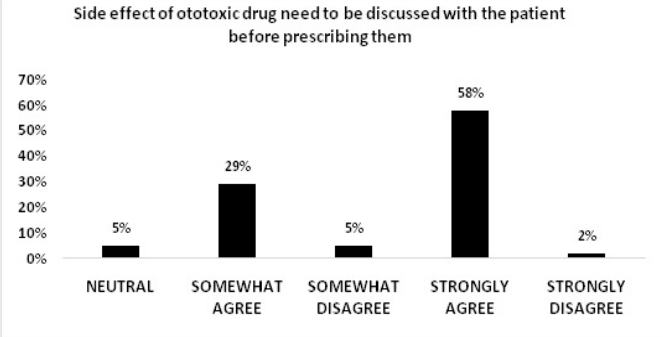


Figure 6. *Ototoxic Medication may Cause Damage to Sensory Cells Responsible for Hearing and Balance*

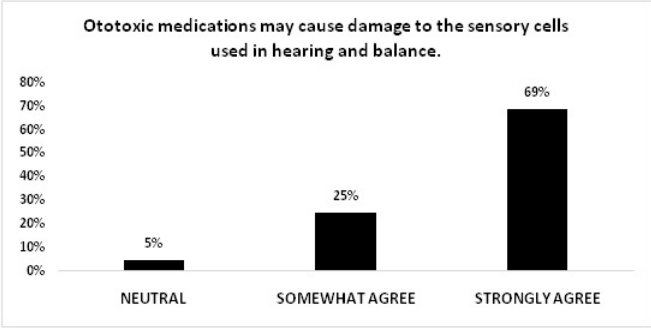


Figure 7. *Awareness Regarding Aminoglycoside Antibiotics Known to Cause Permanent Hearing Loss*

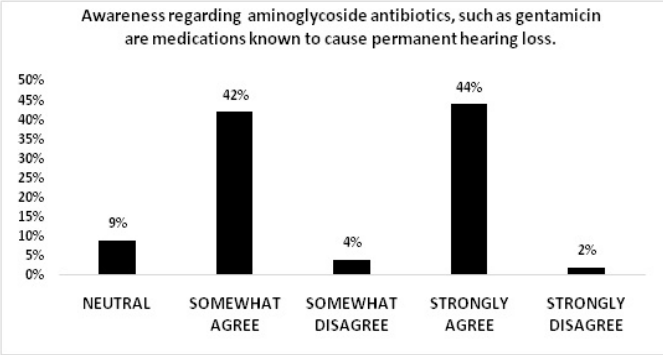
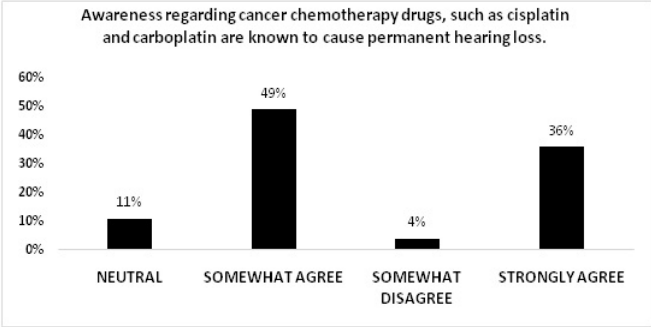


Figure 8. *Awareness Regarding Chemotherapy Drugs Known to Cause Permanent Hearing Loss*



disagreed when asked on the practice of this method. Fifty-four percent (54%) of the doctors in Northeast strongly agreed that they are aware that for cases in which the medications have already been take and cannot be stopped or changed, the patient and the audiologist can take steps to manage the effects of the hearing loss that results. Thirty percent (30%) of the doctors somewhat agreed. Nine percent (9%) of doctors were neutral on this matter. Five percent (5%) of the doctors somewhat disagreed to this and 2% strongly disagreed (Figure 9). Sixty-eight percent (68%) of the doctors strongly agreed that during treatment (with ototoxic drugs), the patient is instructed to have periodic hearing tests as part of the monitoring process, which enables to report any hearing changes, ringing in the ears, or balance problems that the patient may notice. Sixteen percent (16%) of the doctors somewhat agreed. Thirteen percent (13%) of the doctors were neutral on this. The remaining 3% strongly disagreed (Figure 10).

Eighty-four percent (84%) of the doctors in NE strongly agreed that all over-the-counter (OTC) drugs which are ototoxic should be changed to prescription drugs (Rx) to prevent unknown consumption of ototoxic drugs which might lead to hearing loss. Sixteen percent (16%) of the doctors also somewhat agreed to this to be applied.

Figure 9. *Awareness Regarding Routine Audiological Evaluation of the Patients Undergoing Treatment with Ototoxic Drugs*

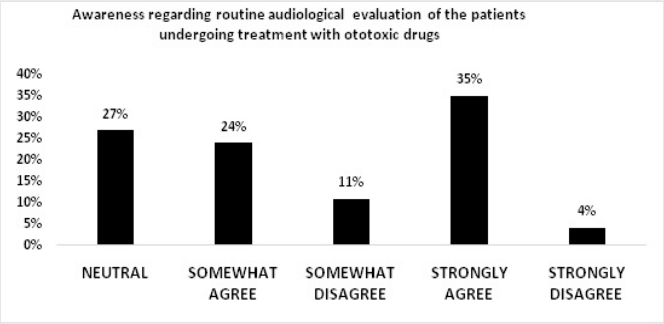
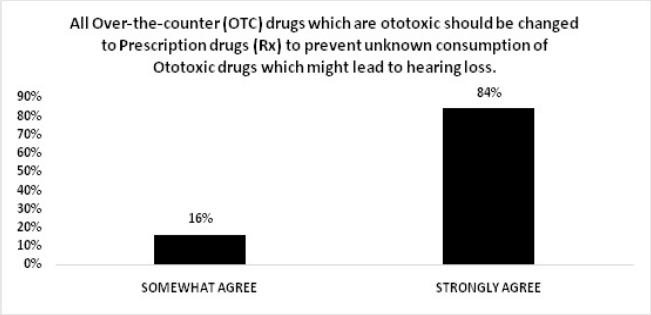


Figure 10. *All Over-the-Counter (OTC) Drugs which are Ototoxic should be Changed to Prescription Drugs (Rx)*



From the present study it was observed that 95.03% respondents responded positively about awareness of the impact of ototoxic drugs on hearing sensitivity, out of which 61.36% of strongly agree and 33.67% of somewhat agree across all 14 questions. It was also reported that 76.36% respondents were aware of referral and consultation services offered by audiologists, out of which 52.83% of strongly agree and 23.53% of Somewhat Agree. Lower sensitivity percentage of 4.97% i.e. combination of neutral, somewhat disagree and strongly disagree responses on all questions may be attributed to the qualitative and professional experience of the medical professionals. However, high percentage identified up to 23.54% of respondents for lack of audiological referral and consultation is alarming. Present study also justifies the extension of this study among other health professionals. This also justifies the need for awareness programs among well trained and highly experienced medical doctors.

CONCLUSION

The findings of the present questionnaire based study showed high awareness percentage about ototoxic drugs, which was a satisfying outcome. While low audiological referral and consultation awareness was identified as an area of concern.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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ISSN 2470-4059

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Editorial

A New Mindset: Artificial Intelligence in Digital Hearing Aids

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Article information
Received: April 1st, 2020; **Accepted:** April 18th, 2020; **Published:** May 8th, 2020

Cite this article
Taneja N. A new mindset: Artificial intelligence in digital hearing aids. *Otolaryngol Open J*. 2020; 6(1): e1-e3. doi: 10.17140/OTLOJ-6-e007

ARTIFICIAL INTELLIGENCE: GENERAL UNDERSTANDING

Artificial intelligence (AI) has a wider scope of its applications in every domain nowadays. Artificial intelligence in general, refers to the field of computer science which generates, uses computer programs to solve complex problems and provides intelligent solutions.[1] For this procedure, several different rules, algorithms, and software can be used.

ARTIFICIAL INTELLIGENCE: ROLE IN THE HEALTHCARE INDUSTRY

When the healthcare industry is considered, AI has been used extensively. Techniques of AI assists physicians in clinical decision making i.e., radiology[2] and tackling various diseases[2] such as cancer[2,3] neurology[2,4,5] and cardiology.[2,6,7] Analysis of big data can be easily obtained by the clinician into a required clinical chunk of data by techniques used in AI.[2] Additionally, the big success of AI in medical literature[2] has been in segregating larger chunks of relevant clinical data from large medical records of patients *via* the use of sophisticated algorithms which may help in achieving efficient clinical decision-making.[2,8,9] AI helps further to physicians to render quality patient care by chunking larger updated information from various sources such as textbooks, clinical practices, and journals.[2,10] In addition, AI technology helps in better medical results with fewer errors in — diagnostic and therapeutic as evidenced more with humans clinical practice.[2,6,11]

ARTIFICIAL INTELLIGENCE — ROLE IN HEARING HEALTHCARE INDUSTRY (AMPLIFICATION DEVICES)

In a similar trend in the hearing healthcare industry, artificial intelligence has been found to be widely in use.[2] Artificial intelligence with reference to amplification devices — digital hearing aids can be understood as a vehicle or platform which facilitates audibility and assists in communication *via* the use of advanced algorithm and software. With the advancement in technology from analog to digital, listening performance has been enhanced for hearing impaired users. But the standard term "digital" doesn't imply all digital hearing aids are the same.[1] They differ in terms of the technology used and hence fall into essential, advanced and premium series. Premium quality in every brand of hearing aids refers to enhanced performance series with multiple advanced features. It incorporates that feature which makes the hearing aid smart, intelligent for its users and here comes in the AI. This new platform assists in the superior performance of hearing aids with respect to real-time acoustic demands. Hearing- impaired patient's experiences various listening situations which may be at times predictable, repeated and or real-time varying or combination of all. In such different situations, signal and noise may not be same all the time. The level of sound and competing signals fluctuates from time to time. Traditional amplification devices were limited to meet such challenging and varying acoustic needs. With the development of technology with digital hearing aids, hearing impaired patients become handy with AI technology.[1,12] These techniques may facilitate the use of features and programs to users and enable them to perform better in noisy conditions with the added performance of directionality cues. For communication to be an effective significant signal to noise ratio (S/N Ratio) has to be maintained. According to previous research[1,13] S/N ratio has been reported to be a major challenge for effectiveness of communication, especially by sensorineural hearing-impaired patients. The overall sound level over noise is crucial for the understanding of the message. It has been reported in the literature that hearing-impaired individuals may perceive appropriately with S/N ratios of +14 to +30 dB for

communication.[1] Louder the background noise, sound signal less effective and reception deteriorates.

Does the major question arise now as to how does digital hearing aids incorporating AI techniques perform so intelligently? AI incorporates two significant approaches[1,14] termed as classical approach and statistical approaches. Classical approaches work based on a predetermined rule structure to analyze input signals to derive output. On the contrary a Statistical approach incorporates analysis of larger sets of data to find patterns and make conclusions for its general applicability. The classical approach has been majorly used in hearing aids programming considering practical aspects of hearing aid users.[1] The rules of this approach are explicit. For deriving the output from a varying situation it has set rules which can easily compare the inputs and gives an output. On the contrary statistical approaches are not explicit which requires the user to hear parallel different potential solutions in the acoustic environment to decide upon the desired output. This may not be feasible for patients in real time-varying acoustic environments that they may thousands of trials in a given setting and decide upon a solution or an output. Hence this approach limits its application for hearing aid programming.[1]

CONCLUSION

Artificial intelligence has more benefits over its limitations, as it assists the users to handle complex situations in real-time *via* the rule-based system and not prediction in isolation. AI technology opens a gateway to allow the usage of complex algorithms and software for problem-solving. AI technology is good, relevant and meant to help hearing-impaired people and it's not just technology of bits and bytes. These computer-assisted applications make routines work very easier and save lots of time. Hearing aid users can be benefited to communicate more effectively *via* the use of different advanced features and programs which work actively in a real- time acoustic environment. The key component of communication i.e., S/N ratio is taken care of effectively thus helping hearing aid users to hear better and understand speech. Professionals can confidently recommend the amplification devices to their patients. The limitations of AI are that though these computer-assisted technologies can effectively fasten daily routine works but cannot mimic human bestowed property of cognition,[1] thinking,[1,15] language processing[1] and social interaction.[16] Owing to its many advantages AI through its applications are accepted world-wide.

CONFLICTS OF INTEREST

The author declares there is NO conflict of interest

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ISSN 2470-4059

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Case Report

Agenesis of the Thyroid Isthmus: A Case Report

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Article information
Received: March 31st, 2020; **Revised:** May 14th, 2020; **Accepted:** June 8th, 2020; **Published:** June 19th, 2020

Cite this article
Mani IP, Raju N. Agenesis of the thyroid isthmus: A case report. *Otolaryngol Open J*. 2020; 6(1): 5-7. doi: 10.17140/OTLOJ-6-160

ABSTRACT

Agenesis of the thyroid isthmus is a rare entity with a incidence rate of 0.5 and 10%. Thyroid isthmus agenesis could be associated with ectopic thyroid tissue or agenesis of the thyroid lobes. We discuss a case of a multinodular goitre which presented with morphological variations which was not detected on ultrasonography of the neck.

Keywords
Thyroid; Head and neck; Isthmus.

INTRODUCTION

There are a large number of morphological variations of the thyroid gland. Dysgenesis of the thyroid isthmus is however, poorly reported with an incidence rate ranging between 0.5 and 10% in literature.[1,2]

The thyroid glands original position is marked by the foramen caecum at the junction between the anterior two-thirds and posterior one-third of the tongue.At the 4th week of intrauterine life, invagination of the endodermal cells of the ventral floor of the primitive pharynx, gives rise to the thyroglossal duct. The duct descends to loop round the hyoid before its descent to the neck to give rise to two lateral buds which develop into the lateral lobes of the thyroid at the level of the second and third tracheal rings.[3]

Variations in thyroid morphology are poorly understood and often associated with ectopic thyroids tissue and morphological anomalies in the gland. Mutation of thyroid transcription factor-2 has been identified as a factor leading to poor development of the gland.[4]

Here, we discuss the case of a 25-year-old female who presented to the Ophthalmic Outpatient Department (OPD) in a euthyroid state with a multinodular goitre, the isthmus agenesis was an incidental finding during total thyroidectomy.

CASE REPORT

A 25-year-old Indian female patient presented with a single progressively enlarging swelling in the midline of the neck. The patient reported to the OPD due to concern over the size of the neck swelling. There was no associateddifficulty in breathing or swallowing due to pressure exerted on the neck by the swelling. Patient gave no history suggestive ofchange in weight, intolerance to heat or cold, changes in the regular menstrual cycle or fatigue. The general physical examination revealed all parameters were within normal limits. Physical examination of the swelling revealed a 5×4 cm firm swelling with palpable nodules over the left side of the neck within the anterior triangle which moved on deglutition. There was no elevation of the swelling on protrusion of the tongue. No palpable cervical lymph nodes were identified on examination.

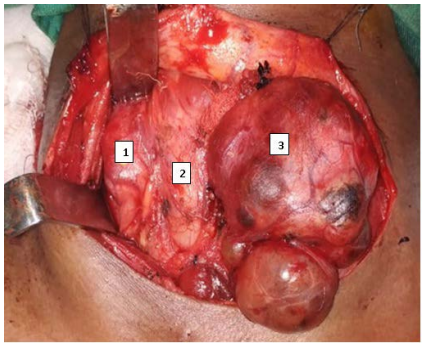
The patient was subjected to ultrasonography of neck which revealed an enlarged thyroid gland with multiple oval shaped, well marginated hypoechoic nodules in both lobes of thyroid. The largest nodule measured 4×3 cm on the left lobe. The isthmus could not be visualized separately from the lobes of the thyroid gland. On doppler interrogation, the left lobe showed increased peripheral vascularity. There also evidence of multiple anechoic cystic lesions with no wall calcification or internal septations seen noted in both lobes of the thyroid. There was no mention of a remnant thyroglossal duct.

Otolaryngol Open J. 2020; 6(1): 5-7. doi: 10.17140/OTLOJ-6-160

A fine-needle aspiration cytology following the ultrasonography of the neck was suggestive of a nodular goitre.

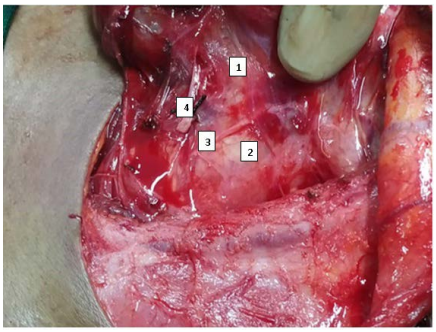
The patient was counselled on the available treatment options, and decided to proceed with an elective total thyroidectomy. Intra-operatively the thyroid gland showed multiple nodules and cysts which appeared to obscure the isthmus. Following the ligation of the superior pole of the left lobe there appeared to be an absence of thyroid tissue connecting both the lobes of the thyroid gland. A thyroid isthmus agenesis was noted (Figure 1). There were no variations in the morphology of the two lobes or in the position of the recurrent laryngeal nerves (Figure 2). Post-operative images include the pre-tracheal facia removed over the tracheal rings between the lobes (Figure 3). The post-operative period was uneventful.

Figure 1. *An Intra Operative Image of the Thyroid Gland with Absence of the Isthmus*



1. Right lobe of the thyroid; 2. Trachea with pretracehal facia and isthmus dysgenesis; 3. Left Lobe of the thyroid

Figure 2. *The Position of the Recurrent Laryngeal Nerve in the Tracheoesophageal Groove*

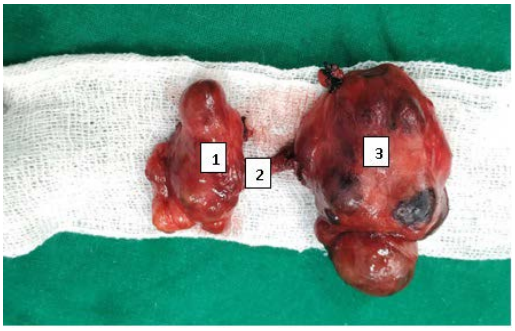


1. Left lobe of the thyroid; 2. Oesophagus below the recurrent laryngeal nerve; 3. Left Recurrent laryngeal nerve; 4. The ligated stump of the Inferior thyroid artery

The block specimen was sent for histopathological evaluation for both the thyroid gland and the connecting pretracheal facia between the two lobes. This was to ensure there was no remnant thyroid tissue connecting the lobes of the thyroid.

The histopathological report was suggestive of a multinodular goitre. The specimen showed a variability in the size of the nodules present in the thyroid gland with large content of colloid. There was no remnant thyroid tissue present in the fascia.

Figure 3. *Specimen Following Total Thyroidectomy*



1. Right lobe of the thyroid; 2. Pre-tracheal facia; 3. Left lobe of the thyroid

DISCUSSION

Normal development of the thyroid gland begins with a median thickening of endoderm on the floor of the pharynx between the first and second pharyngeal pouches. During the 4th week of gestation, invagination of this region leads to the formation of the median diverticulum. The thyroid diverticulum which forms into the thyroglossal duct, bifurcates to give rise to the thyroid lobes and the isthmus. The cephalic end of the thyroglossal duct in degenerates during this process.[3]

Developmental abnormalities of the thyroid can be divided into three major categories: (1) agenesis of thyroid gland; (2) dysgenesis of the thyroid; (3) abnormalities due to persistence of the thyroglossal duct. Dysgenesis of the thyroid gland most commonly presents with hemiagenesis or ectopic thyroid gland tissue.[4] In particular the agenesis of the thyroid isthmus has an incidence rate ranging between 0.5 and 10%.[1,2]

The majority of literature on thyroid dysgenesis is based on cadaveric studies. On dissecting 105 cadavers, Ranade et al[5] reported 34 cadaveric specimens with the agenesis of a thyroid isthmus. Dixit et al[6] studied 41 cadavers with only 6 thyroids showing an absent isthmus with no ectopic or gross change in morphology of the lobes.

Although thyroid hypoplasia has been associated with mutations in the thyrotropin (TSH) receptor, the cause of thyroid agenesis is unknown.[7] Mutations of chromosome 22 or variations in the thyroid *transcription factor 1-2* genes have been reported in to play a role in the anatomical variations of the gland.[8-10]

Embryological developmental anomalies due to a high division of the thyroglossal duct can also generate two independent thyroid lobes with failure of fusion in the midline.[11]

The recurrent laryngeal nerve was identified without an anomalous course in the tracheoesophageal groove below inferior thyroid artery on both sides in this case. The authors could not find articles identifying recurrent laryngeal nerve anomalies associated with thyroid dysgenesis at the time of writing.

Associated variations in the morphology of the thyroid lobes, presence of ectopic thyroid tissue and parathyroid hyperplasia have been reported with isthmus agenesis.[2,6,10] The poor demarcation of the isthmus on radiological evaluation in this case should have raised pre-operative suspicion. The presence of large multiple large nodules over the medial aspect of the left lobe, might have obscured a clear demarcation of the isthmus. A magnetic resonance imaging (MRI) would have provided a clearer clinical image of the thyroid.[12] This however, could not be performed due to the poor financial status of the patient.

A high-level of suspicion for ectopic thyroid tissue is required in cases of thyroid dysgenesis, due to the higher incidence. No ectopic thyroid tissue was identified in this particular case.

CONCLUSION

Thyroid isthmus dysgenesis is a rare clinical presentation which-could be associated with ectopic thyroid tissue or agenesis of the thyroid the lobes. A clear determination of thyroid anomalies during pre-operative evaluation would contribute significantly to safer surgical outcomes and adequate surgical management.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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ISSN 2470-4059

OTOLARYNGOLOGY

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Brief Research Report

Effectiveness of Identafi® in Evaluation of Precancerous Oral Lesions

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Article information
Received: July 16th, 2020; **Revised:** August 6th, 2020; **Accepted:** August 26th, 2020; **Published:** September 3rd, 2020

Cite this article
Fidan V, Koyuncu H, Sakalar E, Turfan B. Effectiveness of identafi® in evaluation of precancerous oral lesions. *Otolaryngol Open J*. 2020; 6(1): 8-10.
doi: 10.17140/OTLOJ-6-161

ABSTRACT

Aim
To examine the role of the Identafi® device in early diagnosis of the nature of oral lesions.

Results
Buccal mucosal lesions that diagnosed Kreatosis were the most seem lesion in oral area.

Conclusion
It has been observed that the indentative device provides convenience to the physician in the early diagnosis of precancerous oral lesions and some tissue formations that may be overlooked can be reached.

Keywords
Identafi®; Oral lesion; Precancerous; Early diagnosis; Tobacco; Alcohol.

INTRODUCTION

Oral cancers; It is a type of cancer that has been diagnosed with lesions in areas such as the floor of the mouth (under the tongue), lips, gums, tongue, inner faces of cheeks, palate.[1-3] Its Mortality rate has increased significantly in recent years.[4,5]

Identafi® is an feasible, ancillary, veiling equipment aspecting three distinct flashes that are practiced subsequently to explore oral ornaments. In addition to a flash transmitting diode (light-emitting diode (LED)) white flash, the equipment also contains violet flash of 405 nm wavelength and a 545 nm wavelength green-amber flash. The violet and green-amber flashes activate ornament fluorescence and reflectance spectroscopy variously.

Looking at the early diagnosis statistics of oral cancer, it is seen that it creates serious differences in terms of survival.[6] Although there is a great responsibility for doctors in early diagnosis, some problems that vary from patient to patient can make early diagnosis difficult.[7] Based on these problems, we conducted this study, which examined the role of the Identafi® device in early diagnosis, on cases we observed suspicious on cases in Eskişehir and encountered remarkable results.

Purpose

The aim of this study is to provide early diagnosis of precancerous oral lesions in the mouth and to determine how it will affect the prognosis in early diagnosis by testing the Identafi® device that will help the physician for this purpose.

MATERIALS AND METHODS

The present study included the patients whom applied to Otorhinolaryngology Department of Yunus Emre Goverment Hospital and City Hospital of Eskişehir between 2011-2019. An initial oral screening was done by otorhinolaryngologists and dentists. The suspected cases were subjected to Identafi® Oral cancers sreening device.

This device is designed for light; it uses the energy it broadcasts at different wavelengths by combining it with different reflection feature between malignant and bening tissue. The device, by its design, has many features that will make it easier to scan the restrictive oral area. Thus, the findings required for early diagnosis can be easily detected even in hard-to-reach areas.

RESULTS

The identification device has been tested in cases of suspected suspicion and numerical data have been obtained that can be classified according to cigarette, alcohol, spicy food use, age and gender, oral location (Tables 1, 2, 3, 4, 5 and 6).

Table 1. *Distribution of Study Subjects by Gender*

Gender	n (%)
Male	284 (47.3)
Female	317 (52.7)
Total	601 (100)

Table 2. *Distribution of Subjects Based on Consumption of Smoke*

Status	n (%)
Smoker	48 (8)
Non-smoker	553 (92)
Total	601 (100)

Table 3. *Distribution of Subjects Based on Consumption of Alcohol*

Status	n (%)
User	284 (47.3)
Non-user	317 (52.7)
Total	601 (100)

Table 4. *Distribution of Study Subjects by Gender*

Lesion Type	n (%)
Leukoplakia	149 (24.8)
Erythroplakia	8 (1.3)
Lichen planus	217 (36.1)
Fibrosis	165 (27.5)
Keratosis	209 (34.8)
Total	601 (100)

Table 5. *Distribution of Study Subjects Based on the Site of the Lesions*

Site	n (%)
Palate	2 (0.4)
Floor of mouth	1 (0.2)
Tongue	25 (4.2)
Buccal mucosa	573 (95.2)
Total	601 (100)

Table 6. *Distribution of Study Subjects Based on the Site of the Lesions*

	Lesion	Without Lesion	*p*	Odds Ratio
Tobacco user	45	3	0.001	14.310
Tobacco nonuser	7	546		
Alcohol user	23	4	0.001	9.612
Alcohol nonuser	2	572		

CONCLUSION

The conclusion of this study; it has been observed that the indentative device provides convenience to the physician in the early diagnosis of precancerous oral lesions and some tissue formations that may be overlooked can be reached.[8,9]

There liability of the device would depend upon further studies which can reveal its specificity and sensitivity.[8,9] The effectiveness of this devise when proved and reduction of the cost of the device would make it a popular and common screening tool among dentists and dental schools in the detection of oral cancer in the community. Studies have shown a strong relationship between the use of tobacco and alcohol in the development of precancerous lesions.[6-9] This study also presents that tobacco was a capable prognosticator for improvement of precancerous lesions.

The gains of the Identafi® equipment is it is modest, firm extent deuced with a twisted diagnosis reflector which grants customers to obviously observe tough-to-grasp fields, such as beneath the tongue, and behind of the pharynx.

The government authorities should provide training to rural health workers to enable them to screen patients for oral precancerous lesions and refer them for biopsy and further management at higher centres. The health authorities should provide regular health education on the hazards of tobacco use to school children thereby deterring them from adopting the habit of tobacco use.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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