

Vol. XIII, No. 3

SEPTEMBER 1961

720
4-61



361

INDIAN JOURNAL
OF
OTOLARYNGOLOGY



PUBLISHED BY
The Association of Otolaryngologists of India

ADVERTISEMENT TARIFF

		<i>Full Page</i>	<i>Half Page</i>
		Rs.	Rs.
BACK COVER PAGE	...	200/-	Not available
INSIDE COVER PAGE	...	125/-	75/-
FULL ORDINARY PAGE	...	100/-	65/-

★
10% Discount if paid in
Advance for 4 insertions

★
Address all correspondence to:

THE EDITORIAL SECRETARY

Indian Journal of Otolaryngology

1-A, Marshall's Road, Egmore, Madras-8.

INDIAN JOURNAL OF OTOLARYNGOLOGY

Vol. XIII, No. 3

SEPT. 1961 *361*

Official Scientific Journal of the Association of
Otolaryngologists of India

Editorial Board

<i>Chairman</i>	...	Major N. DUTT
<i>Editor</i>	...	Dr. V. S. SUBRAMANIAN
<i>Treasurer</i>	...	Dr. C. M. LEELAVATHY
<i>Editorial Secretary</i>	...	Dr. U. ANANDA RAO

INDIAN JOURNAL OF OTOLARYNGOLOGY

1-A, MARSHALL'S ROAD EGMORE, MADRAS-8

CONTENTS

	Page
Role of Mastoid Cells in Bone Conduction S. N. Jain	99
Investigations of Hearing in School Children Prof. R. N. Misra, Dr. M. L. Bhatia and Dr. B. P. R. Bhatia.	107
Otomycosis Achyutananda Sinha and L. N. Mohapatra.	128
An unusual Manifestation of Scleroma Dr. O. P. Gupta and Prof. R. N. Misra.	138
A Case of Congenital Dermoid Cyst of the Nose Leelavathy and Mukundan.	141
An unusual case of Acute Monocytic Leukaemia with Otitis Media and Bilateral Facial Paralysis Dr. S. N. Sinha and Dr. H. Navani.	144
Association Notes	149

Protein Biscuits **VITAL PROTEIN**
IN
AN EXCEEDINGLY PLEASING AND CONVENIENT FORM
IS AVAILABLE IN

THREPTIN BISCUITS

The Palatable
PROTEIN-CARBOHYDRATE-B VITAMIN FOOD
IN CRISP AND DELICIOUS BISCUITS

Accessible even to lower income groups, because 3 oz. (18 biscuits) supply as much protein as 1½ seers of milk or 8 oz. boneless lean meat or 7 eggs.

CONTENTS PER OUNCE : Protein (intact casein) 50%, Carbohydrate 30%, Thiamine and Riboflavin 1 mg. each, Vegetable fat 7.5%, Flavouring Agents q.s.

Particulars from : Available in 0.45 kg. (1 lb.) tins.
RAPTAKOS, BRETT & CO., PRIVATE LTD., WORLI, BOMBAY

in ear infections

simpler

surer

swifter treatment

CHLOROMYCETIN EAR DROPS

Contains

5% Chloromycetin

in propylene glycol

with 1% benzocaine

PARKE-DAVIS

Enteromycetin

(CHLORAMPHENICOL U. S. P.)

OTIC SOLUTION

**For topical therapy in external
and middle ear infections**

ENTEROMYCETIN Otic Solution contains 10% chloramphenicol in propylene glycol base providing local bactericidal concentration in each drop to the commonly occurring organism in acute or chronic otorrhoea.

INDICATION

Acute or chronic otorrhoea particularly due to *B. Coli*, *Strepto*, *Staphylo*, *Proteus*, *Pseudomonas*, etc., following ear operation (mastoid), it can also be used topically in other wound infections, e.g. infected ulcers, pedicle flaps, skin grafting, abscess cavities, etc.

Manufactured by



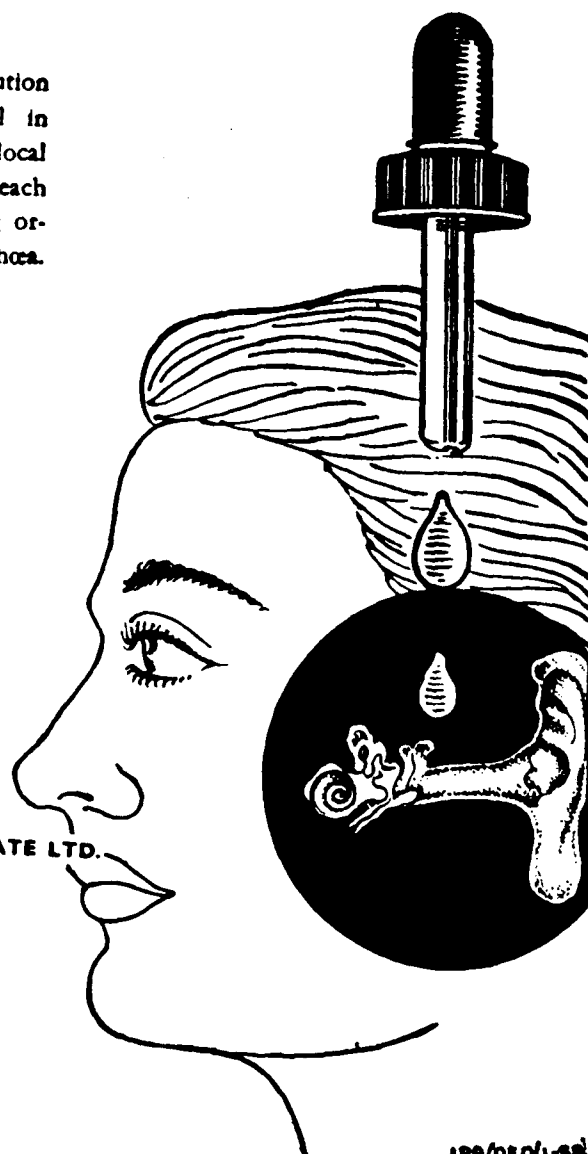
DEY'S MEDICAL STORES (Mfg.) PRIVATE LTD.
CALCUTTA-19

Under Licence from

ZAMBON S.p.A. VICENZA (Italy)

Exclusive Distributors

DEY'S MEDICAL STORES PRIVATE LTD.
CALCUTTA - BOMBAY - DELHI - MADRAS
PATNA - GAUHATI - CUTTACK



IPA/DECI-58

Indian Journal

OF

OTOLARYNGOLOGY

OFFICIAL SCIENTIFIC JOURNAL OF THE ASSOCIATION OF OTOLARYNGOLOGISTS OF INDIA

Vol. XIII, No. 3

SEPTEMBER 1961

Role of Mastoid Cells in Bone Conduction

BY

S. N. JAIN.

INTRODUCTION

The cellular structure of the Temporal bone has been a subject of study from the early period of the evolution of Medical Science. Galen, Stevensen and Guthrie, 1949) the ancient Greek dictator of medicine derived his knowledge of Anatomy from the dissection of animals, dogs, pigs and apes. Air cells are invariably present in every temporal bone, although their extent differs considerably from bone to bone. Very little is known about their function. The following functions have been attributed to the cellular structure by various workers (Diamant, 1940 and Tumarkin, 1957).

1. Resonance.
2. Acoustic dissipation.
3. Reservoir action.
4. Insulation.
5. Reception.

It is the purpose of this study to pursue this work further and to find out if the cellular structure has any role to play in the sound absorption. Macdonald (1949 & 1951) has discussed in detail, the necessity of the absorption of pent up sound waves in the middle ear. He emphasises the fact that the middle ear

is a closed pocket except when the Eustachian tube opens intermittently. It is well known that a vibrating membrane over a closed pocket causes vibrations to build up in the pocket. These, if not absorbed, shall greatly interfere with the vibrating membrane.

Woods (1950) studied the acuity of hearing for masked bone conduction, before and after fenestration operation, in forty six consecutive cases.

Makey Pullen (1950) observed that large cellular mastoids in otosclerotic patients have resulted in bone conduction loss upto 25 db.

Haraguchi (1952) studied the difference in the threshold of air and bone conduction sounds between the groups with overdeveloped and under-developed pneumatisation.

MATERIAL AND METHOD

Fifty intelligent young adults, between the age of 20 and 30 years, were chosen from Prince of Wales Medical College, Patna. Before selecting a subject every precaution was taken to see that his hearing was not impaired in any respect. His past history was obtained. Thorough Ear, Nose and Throat examination was carried out. Normal air conduction audiogram (10 db. was allowed for individual variation) and the absence of loudness balance or recruitment and normal speech audiogram were taken as a necessary pre-requisite in the choice of subjects. Precision Amplivox Audiometer was used for this study and the tests were carried out in fairly quiet and uniform surroundings. Both ascending and descending techniques were used and every frequency was repeated atleast twice to get an accurate record. The lowest audible frequency was recorded. While testing the bone conduction, ear phones were kept over both ears. The one over the opposite ear was for delivering the masking tone and the one over the tested ear to exclude the outside noises and also to produce partial occlusion effect.

Every precaution was taken to make the audiometric tests accurate. Due to limited number of lower intensities provided in the audiogram, hearing below minus ten could not be assessed.

The X-Rays of the mastoids of these subjects were taken in oblique lateral or Law view. This view was chosen because of easy repetition and the clear view they give of the cellular arrangement including that of the antral region. Finally all the results were tabulated and were submitted for statistical analysis.

OBSERVATIONS

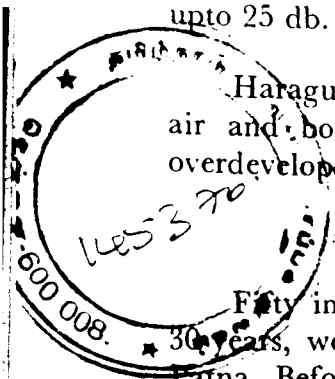
For convenience the subjects have been divided in the three groups according to the cellular structure of their temporal bones.

Large or predominantly large cellular	... 44 (ears)
Small or predominantly small cellular	... 33 (ears)
Acellular	... 22 (ears)

Left ear of one case is not included in this study as the subject had almost no audible bone conduction sound in that ear (case No. 15) with good air conduction. Difference in the air and bone conduction hearing (hereafter referred as air bone gap) was recorded for the following frequencies:

250 (C₁), 500 (C₂), 1,000 (C₃), 2,000 (C₄) and 4,000 (C₅)
C.P.S.

There are factors here which may make the usual criterion invalid. The mean can differ either because the sample chosen was not normal or the assessment of the cellular structure of the mastoid was not exact in borderline cases. The later factor tends to make the distribution of mastoid index skew. The magnitude of this effect could be found by examining a large number of cases but tentatively it will be assumed that "Mastoid index" as measured above for normal cases is distributed normally.



JL
L183:4m.2, 229107 N61 13.

Application of 't' test for statistical significance shows the significant shifts in the following frequencies:

1. Large cellular mastoid ... C_1, C_2, C_4, C_5
2. Small cellular mastoid ... C_1
3. Acellular mastoid ... C_1 & C_5

DISCUSSION

Macdonald (1949, 1951) has tried to prove the sound absorption property by the following observations.

(1) He recorded the bone conduction through the facial canal in a subject who had lost his ear drums in childhood by using an instrument similar to the acoustic probe and compared it with the ordinary bone conduction and found the former to have much lower threshold.

(2) He recorded the bone conduction and compared it with ossicular conduction in ten cases that were selected for fenestration operation. All the patients tested showed, on Gelle Test, fixation of stapes. Ossicle conduction test gave him a much lower threshold of hearing than the regular bone conduction.

(3) He noticed that hearing of patients with dry perforations after the insertion of artificial ear drum depends on the patency of the aditus. In cases where this was blocked by crust or other debris the gain of hearing was definitely below expectation. He proved the same thing in such cases by testing the hearing before and after obstructing the antrum by gauze pack.

(4) He built an apparatus and produced conditions similar to those of mucus lined mastoid air cells. First he used lead stoppers only and found that there was distortion of sound most pronounced at 64 D.V., producing a tone some octaves higher. It usually was heard before the true tone was audible. When the sound absorbing attachments were used instead of the lead stoppers there was no interference that could be detected.

(5) He attributed the lowering of the threshold of bone conduction recorded in few cases, after fenestration operation to the thorough cleaning of the air cells.

Woods (1950) recorded masked bone conduction before and after fenestration operation in forty six cases. It is interesting to note in his series that the maximum post-operative gain in bone conduction is in cases belonging to groups in which the loss was in between 10-40 db. This gain could be accounted for only due to destruction of large cells during the operations.

Makey Pullen (1950) has emphasised that in cases of large cellular mastoid, drop of threshold of bone conduction does not necessarily mean "frank nerve deafness." He has noticed that large cellular mastoid can be accounted for the losses upto 25 db. in otosclerotic patients.

Haraguchi (1952) classified roentgenologically, middle ear pneumatisation with regard to its degree of development into three groups, (a) over-developed (b) well-developed and (c) under-developed. An audiometric examination was made on 18 cases with over developed pneumatisation, 22 cases with bilaterally under developed pneumatisation and 16 cases with unilaterally undeveloped air cells system, selected from 206 healthy youths. There was found no remarkable difference in the threshold for air conduction sound between the groups with over developed and under developed pneumatisation.

The threshold for bone conduction sound in the under-developed bones was about 5 db. lower than the others, using a frequency between 256 and 2048 c.p.s.

The absorption of sound waves does not interfere with air conduction sounds, or the bone conduction sounds in the important speech frequencies, and so does not interfere with the proper functioning of the ear. But their important sound absorbing role has to be remembered when operating in this region.

The air cells are destroyed in the mastoidectomies. If this is done at a younger age nature attempts to reform these cells, but in older persons if complete mastoidectomy is performed, the partial loss of cellular function is permanent.

After simple mastoidectomy in which antrum has been left intact, many of the cells left in the mastoid process at operation will continue to function, and good hearing may follow the operation. As few cells invariably escape during this operation, complete loss of cellular function never follows; however, the slight loss of hearing after this operation is undoubtedly due to the loss of function of these cells.

In the fenestration operation many of these cells are sacrificed and the flap covers the antrum; so the only sound absorbing element left are the cells directly connected with the middle ear. This reduces the excursion of drum membrane and hence the acuteness of hearing is affected. This is noted more frequently in cases where active fistula reaction can be obtained by touching the drum. In cases where adhesions bind drum to the prominence of the facial canal, the sound interference in the middle ear will have little or no effect on hearing, which in this event will be poor anyway (Macdonald, 1951).

Day (1945) from his appraisal of one hundred cases of fenestration advocates not to enlarge the mastoid cavity unnecessarily as it would give rise to an echo phenomena. Macdonald describes, with the full support of a sound engineer that even enlarged cavity is much too small to produce an echo, but this phenomena is produced by the vibrational interference and distortion of sounds that occur in the middle ear in consequence of the destruction of the sound absorbing air cells of the mastoid process.

SUMMARY AND CONCLUSIONS

Impedence of the mastoid process and its cellular structure in the transmission of sound waves by bone conduction is studied by a hearing survey of fifty, educated, normal, young adults, or hundred ears under similar conditions. Possible care is taken to exclude the subjects that are not normal. Clinical examination,

hearing by air conduction, loudness balance test (Fowler) and speech audiometry (S. R. Threshold and P. B. Score) are used for selecting normal subjects. The bone conduction tests are carried out in detail. The X-Rays of the temporal bones of these cases are obtained in oblique lateral (Law) view.

It is observed that mastoid cells act as sound absorbing elements. In the large or predominantly large cellular mastoid there is a greater loss of hearing by bone conduction at non-speech frequencies (250 and 4,000) as compared to the other types.

ACKNOWLEDGMENT

The author is greatly indebted to the Dean, Faculty of Medicine, University of Patna for his kind permission to publish this work which was carried out under the constant supervision and guidance of Prof. P. N. Sinha, Head of the E.N.T. department University of Patna. Professor P. E. Ireland Head of the Department of Otolaryngology, University of Toronto (Canada) has been a source of encouragement in pursuing this work.

BIBLIOGRAPHY

1. Diamant, M.: *Acta Otolaryng.* (Stockh.) suppl. 41, 1940.
2. Haraguchi, S.: *J. Oto-Rhi-Laryng. Soc., Japan*, 56, 595, 1953.
3. Lempert Julius 1939: Cited by Macdonald, 1949.
4. Macdonald, G.: *Archives Otol.*, 51/5, 641, 1949.
5. Pullan E. Markey (1950): Abstract in *Archives Otol.*, 1951.
6. Scott Stevenson & Guthrie: *History of Otolaryngology*, Livingston, Edinburgh, 1949.
7. Tumarkin: *J. Laryng* 71/1, 211-248, 1957.
8. Woods, R. R. *Archives Otol.*, 51, 485-409, 1950.

For the best results in E.N.T. practice

REVERIN®

Pyrrolidinomethyl tetracycline

the **outstanding broad-spectrum antibiotic**
for direct intravenous injection.

Advantages

Very high initial blood levels
Effective tissue concentrations
Reliable therapeutic action
No disturbance of the
intestinal flora
Excellent general tolerance
No thromboses or tissue
necroses
Ease of administration (in-
jection in 1 minute with
10 ml. double distilled
water as solvent)

Indications

Sinusitis
Tonsillitis
Peritonsillar abscess
Retropharyngeal abscess
Acute otitis media
Mastoiditis
Oto- and rhinogenic
meningitis
Nasal furuncles
Antibiotic cover in
plastic surgery

Presentation

Vials of 275 mg.



Detailed information from

HOECHST
PHARMACEUTICALS
PRIVATE LIMITED
BOMBAY • CALCUTTA • MADRAS • NEW DELHI

Investigations of Hearing in School Children

BY

Prof. R. N. MISRA, Dr. M. L. BHATIA

AND

Dr. B. P. R. BHATIA.

INTRODUCTION

It is said, and very truly so, that the gates of all knowledge in an individual are his eyes and ears; they are the only two means through which every human being quenches his thirst for knowledge. Healthy eyes and ears are therefore the primary requisites for every normal man and woman; nevertheless we find from common knowledge, that eyes are much more carefully looked after than the ears. So much so that, whereas blindness evokes our pity the deaf are the object of ridicule. In our opinion no handicap of the human body is probably so neglected as deafness is. This is probably due to the fact that deafness has been regarded as irremediable, and unlike spectacles for defective vision, use of hearing aids could not be so universal.

Surprisingly enough deafness to a certain degree is not so uncommon as one may be lead to believe. Crowe (1944) states that almost forty percent of children between the ages of eight and fourteen years show impairment of the threshold of hearing. Silvermann (1947) states that in any class-room of thirtyfive or forty children, there is more than an even chance that there will be a child with as much hearing loss as to justify special attention on him.

The sense of hearing has two dimensions when considered clinically-- Quality and Quantity. Loss of hearing, when thought of in relationship to little boys or girls, must be viewed in addition from the point of advantage in communication, to its duration in the life of the individual, its acceptance both

intellectually and emotionally by the child and his parents, and the availability of facilities for rehabilitation in a given community.

Normal hearing implies the ability to appreciate and recognise the meaning of sounds and more so of the spoken word. This is called AUDITORY DISCRIMINATION (Edith Whetnal 1952) and involves the ability to distinguish the simple sounds of every day life to the more complex sounds of speech. Auditory discrimination is learnt in the first few years of life. As the child becomes older this ability to distinguish sounds becomes progressively lesser and lesser also affecting the ability to speak. This can be easily demonstrated in the case of an adult who learns a new language or dialect when he settles down in a new State. His conceptions of speech are fixed and it is very difficult for him to distinguish the phonetic elements of the new language. Even if written language is perfect and fluent, abnormalities of pronunciation and intonation can always be distinguished when we come across an individual who comes to Uttar Pradesh from Bengal, Madras or the Punjab.

The school boy or girl, perfects his or her speech only by means of careful and constant listening to sounds which are repeated very often into his ears (Seth & Gurthrie). We know therefore that if a child has a loss of hearing he will hear a distorted version of speech sounds, the sound will be memorised in the same manner by the brain, and thus when asked to reproduce he will reproduce the same distorted version of speech due to no fault of his. Such children may be classed as mentally dull, even though they may be possessing normal intelligence. Indeed the word "dumb" for children who appear mentally dull due to their speech defect, is most suitable since it does not allude to their intelligence. The distortion of sounds may be experienced by the normal listener when he talks over the telephone *e.g.*, when enquiring the time of arrival of a train his expression of Gaadi kab jaati hai may be wrongly interpreted as Gaadi kab jaati hai and he may be given the time of departure instead of arrival.

Deafness of almost any type and of any degree distorts the sound of speech. Because of the complex nature of speech, deafness will produce varied effects on its reception and reproduction. It may vary from distortion or omission of certain speech sounds to complete absence, if the hearing loss is profound.

(a) *Sampling.*— Sampling is one of the very important aspect of a hearing survey. One finds that this aspect is very much overlooked and therefore one arrives at several results which do not conform to a uniform pattern (Goldberg 1956), and therefore cannot be compared. O'Neill and Grimm (1958) support this view, and state that the stated purpose of any hearing survey is the collection of a random sampling of the hearing acuity of a specific population; but they go on to emphasise that such a sample should not be voluntary *i.e.* the subjects should be brought to the examination centre and not asked to come there. The latter point is very well illustrated by their own work in the Ohio State Fair, where a hearing survey was organised. Since all subjects were asked to come, only 1.7 per cent of them availed of the opportunity, of these most of them were such who already suspected a hearing loss (Glorig and Wheeler). Women usually are shy and therefore did not turn up in a balanced proportion. The third point which this survey lost in sampling was that individuals of age varying from 14 to 65 years were asked to appear for examination; there was a tapering off at the ends, and the sample did not remain representative from the age point of view.

We have in this survey incorporated all the suggestions pointed out by O'Neill and Grimm.

- (1) Schools were selected from their socio-economic standards, thus at least one school of each type was taken.
- (2) Each child in the school, from the age of 3 yrs. to 12 yrs. was examined thus eliminating the hearing loss bias.

- (3) Adequate balancing from the point of view of sex was done.

Thus we have children in three sub-headings :—

(A) *Age*—Children were divided into three groups—

- (i) 3-5 yrs. of age.
- (ii) 6-8 yrs. of age.
- (iii) 9-12 yrs. of age.

(B) *Sex*—

- (i) Male.
- (ii) Female.

(C) *Socio-economic status*—

- (i) Upper strata.
- (ii) Middle strata.
- (iii) Lower strata.

The schools were selected in such a way that the whole city of Lucknow was covered.

(b) *Method of Examination and Testing Hearing*.—As is agreed by all it is a well known fact that the examination of hearing in a child is an art in itself, and can be accomplished only after a thorough study of the child's psychology and behaviour at a particular age. The approach of the Otologist and his experience, are certain other factors which help in the saving of valuable time in examination, but things should never be hurried through. Even after all the care, the most experienced will once in a while come across a child whom it is most difficult to examine and to arrive at a conclusion at one sitting.

(i) *History*.—The question of eliciting any aspect of the history of the child from him does not arise. The parents themselves also cannot devote enough time for interviews at school about their children, unless a regular and complete medical examination includes hearing as a part of it at the time of admission of a child to a school.

A questionnaire in Hindi was therefore drawn out. A copy of this was given to the child who took it home to his mother, she then easily answered all the questions on it at her leisure, and sent it back the next day. The questionnaire was precise and gave the following informations.

1. The correct age of the child.
2. The correct income of the guardian of the child.
3. Status of hearing, including hearing response.
4. Previous history of sore throat, fevers, small pox and other eruptive fevers etc.
5. Status of speech of the child.

(ii) *Physical examination*.—We agree with Hienemann (1955) that testing of children upto the age of 6 or 7 years is a very difficult problem and prone to fallacy. As Kendal says the diagnosis has to be made from inference including inference from the child's response to sound. Further difficulties arise with maladjusted children whose psychological problem renders them particularly shy fearful and uncooperative.

We feel that our procedure though principally similar incorporates the following advantages :—

1. Equipment is the minimum required for a thorough examination of the ear, nose and throat.
2. Apart from the status of hearing the pathology behind a hearing loss is also detected.

3. It is thus found, whether a hearing loss present is amenable to treatment, whether it is progressive or stationary, and whether a hearing aid and lip reading can help in improving that particular hearing loss.
4. It also helps us to find out children who require special attention in the class due to this hearing handicap.
5. It gives us an idea of the effects of bad and good hygienic surroundings over the ears of children and consequently their hearing.
6. Above all it gives us comprehensive ideas of the preventive aspects of hearing which can be incorporated in a hearing conservation programme.

(c) *Assessment*.—For the purpose of training, classification of the grades of deafness are extremely essential. The Board of Education Committee (1938) classified grades of deafness in the following manner :—

Partial deafness (slight), Grade I—includes children found by group audiometry to have a hearing loss upto about 15 db. These children constitute Grade I of the Board of Education Committee's classification.

Moderate to severe, Grade II-A—when the hearing loss is such that a conversational voice cannot be heard by the child in an average length of a classroom, a favourable position towards the front must be given with lipreading instruction. When hearing for conversational voice is less than about 6-10 feet a hearing aid will be necessary. If a speech defect is present this must also be corrected. These children must be placed in Grade II-A, because by being given special help, they can adjust and make progress. It is important that constant follow up by an Otologist and teacher of the deaf is carried out every six months in these cases to see that the child is making progress satisfactorily.

Grade-II B—The child who cannot make progress with an aid, and lipreading in the front row is the child who is classified as Grade-II B, such a child must not be classified in Grade III, as he does not require education by methods for the deaf. A child who has enough hearing to acquire speech must never be educated with children who cannot acquire speech in the same way. These children fail to make progress for one of two reasons :—

1. Inadequate rehabilitation or
2. Subnormal mentality.

Total deafness Grade III—A child who acquires total deafness after the development of speech and language should never be classified as Grade III. This group is confined to those children in whom both hearing and speech loss are present.

(c) *Incidence*.—Yearsley (1934) examined about 5,700 cases of educational deafness over 25 years, the results of his analysis were as follows :—

		Boys	Girls
1. Congenital	...	670	614
2. Diseases of the nervous system	...	214	168
3. Infectious diseases and fevers	...	447	529
4. Cretinism	...	3	6
5. Primary middle ear diseases	...	1445	1490
6. Doubtful	...	49	56
	Total ...	2828	2863
	Grand Total ...	5691.	

Thus out of 5,691 deaf subjects, middle ear disease was responsible for 2935 or 53 percent.

V. Alison Grover (1943) stated that chronic suppurative otitis media in school children was mostly found in entrants, and diminished during life year by year. Its frequency in London has steadily fallen.

Thus it has been found in :—

Year		Percentage
1911	...	3·7
1920	...	2·0
1930	...	1·0
1935	...	0·8
1938	...	0·6
1940	...	0·3
1941	...	0·3

The incidence in 1941 was thus only one twelfth of what it was thirty years before.

Phyllis Kerridge (1940) stated that in a sample of 5,000 children, of the deaf, over 80% were deaf because of chronic suppurative otitis media.

Falbe Hanson (1954) writes that in audiometric testing of 2,550 pupils in Municipal Schools in Copenhagen, Denmark, 295 had hearing defects. Of these 21·7% were due to defective perception 78·3% were due to defective sound conduction.

Fowler and Basek (1954) made a study of deafness in children under 5 years of age. 270 children were studied from their records. Of these otitis media made up the largest group of 45 children.

Crowe (1944) states that almost 40 percent children between the age of 8-14 years show impairment of threshold of hearing due to eustachian tube infection.

In an audiometric testing of school children in Denmark Municipal Schools, Falbe Hanson (1954) found that 295 had hearing defect. In the socially poor sections there were 15·16 percent pupils with hearing defects; in the more favourable sections only 9·7 percent.

Hofsommer (1936) shows in her hearing survey of school children of Webster Groves, St. Louis County, Mo., that a majority of children with impaired hearing have a low intelligence quotient. This is due mainly to lack of educational experience and is not a result of mental deficiency.

An estimate by the Board of Education (1938) of the number of school children in England with defective hearing amounts to roughly 90 per 1,000 children in average school attendance *i.e.*, one third of a million in all. In 95 percent of these children defects are slight; children therefore cannot be said to have a educational handicap. But of these 98 percent children need medical attention over long periods for the sake of their general health in order that they may not grow into deaf adults. The majority of defects of hearing in these children are due to chronic suppurative otitis media.

According to the same estimates in 5,000 children, defective hearing was four times more common on the average elementary school children as it was among children whose fees was paid by their parents. Over 80 percent of these were due to chronic middle ear disease. Average failures among the poor were 12 percent rising to 22 percent in the worst cases.

(d) *Observations.*—In all one thousand five hundred and eighty-one questionnaires were distributed among the children. Of these one thousand two hundred and fifty-nine questionnaires were completed and returned to us by the parents or guardians of the children. In all one thousand three hundred and ninety children were examined. One hundred and ninety-one were absent from school on more than two occasions.

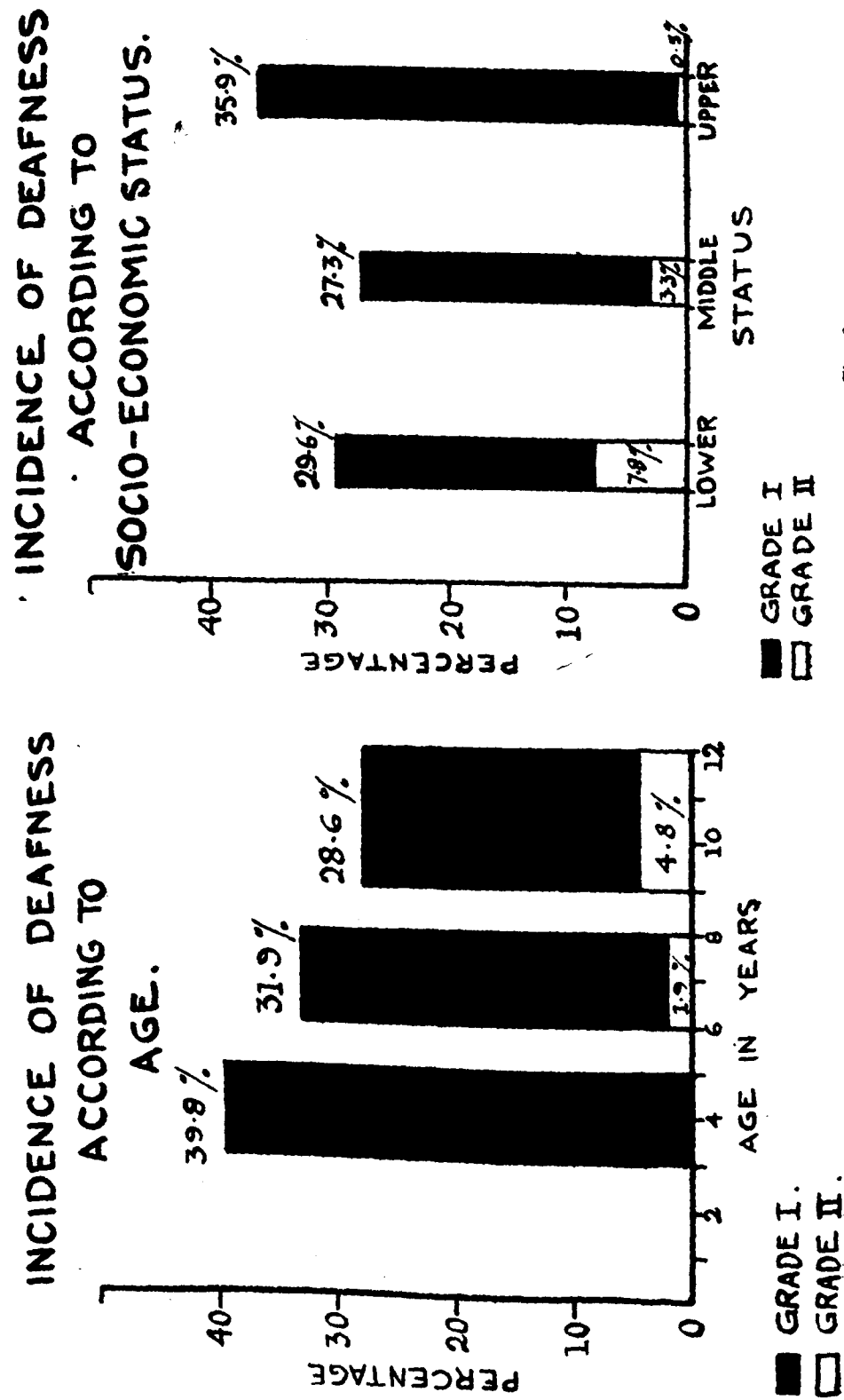


Fig. 1

Fig. 2

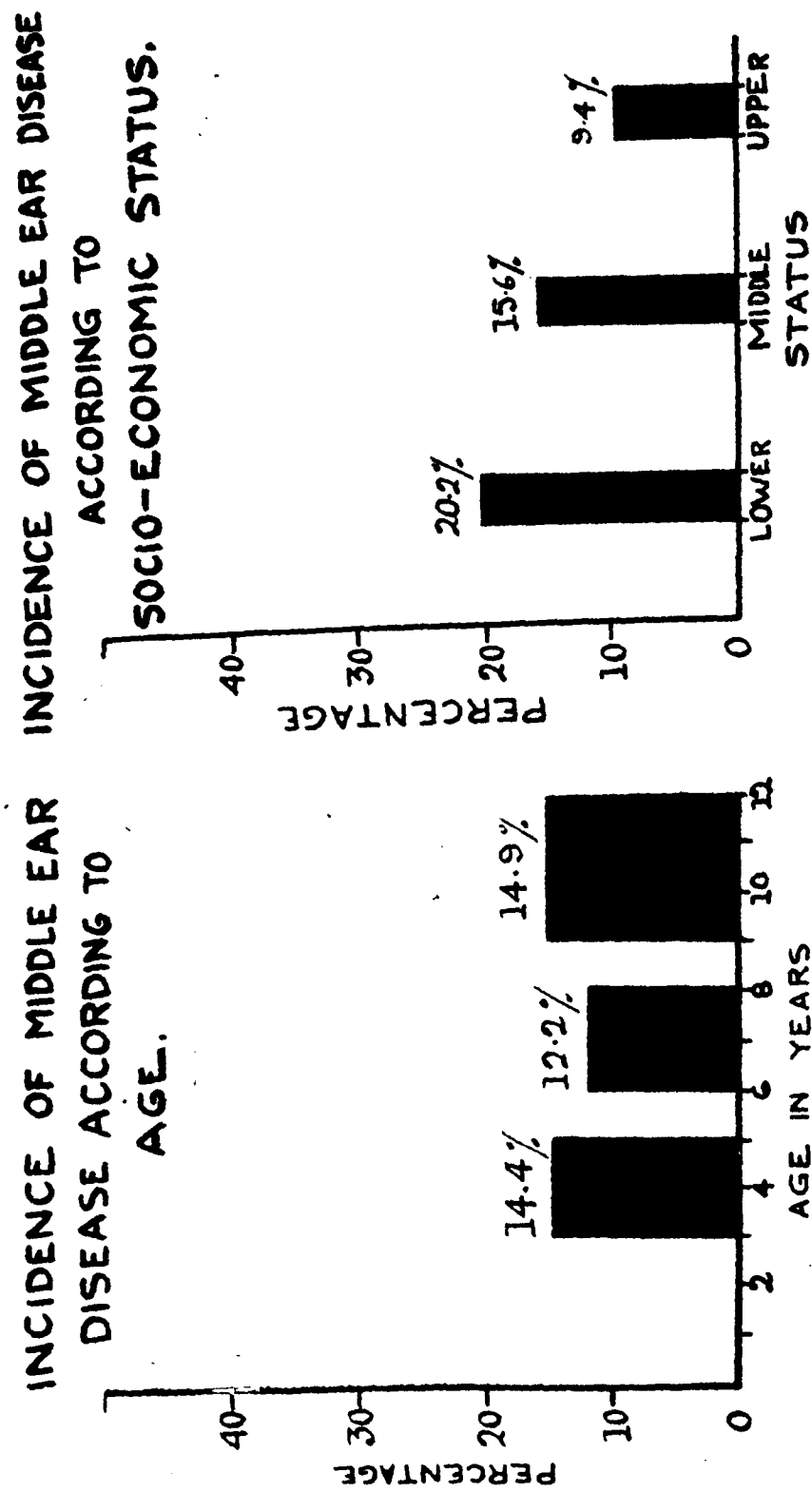


Fig. 3

Fig. 4

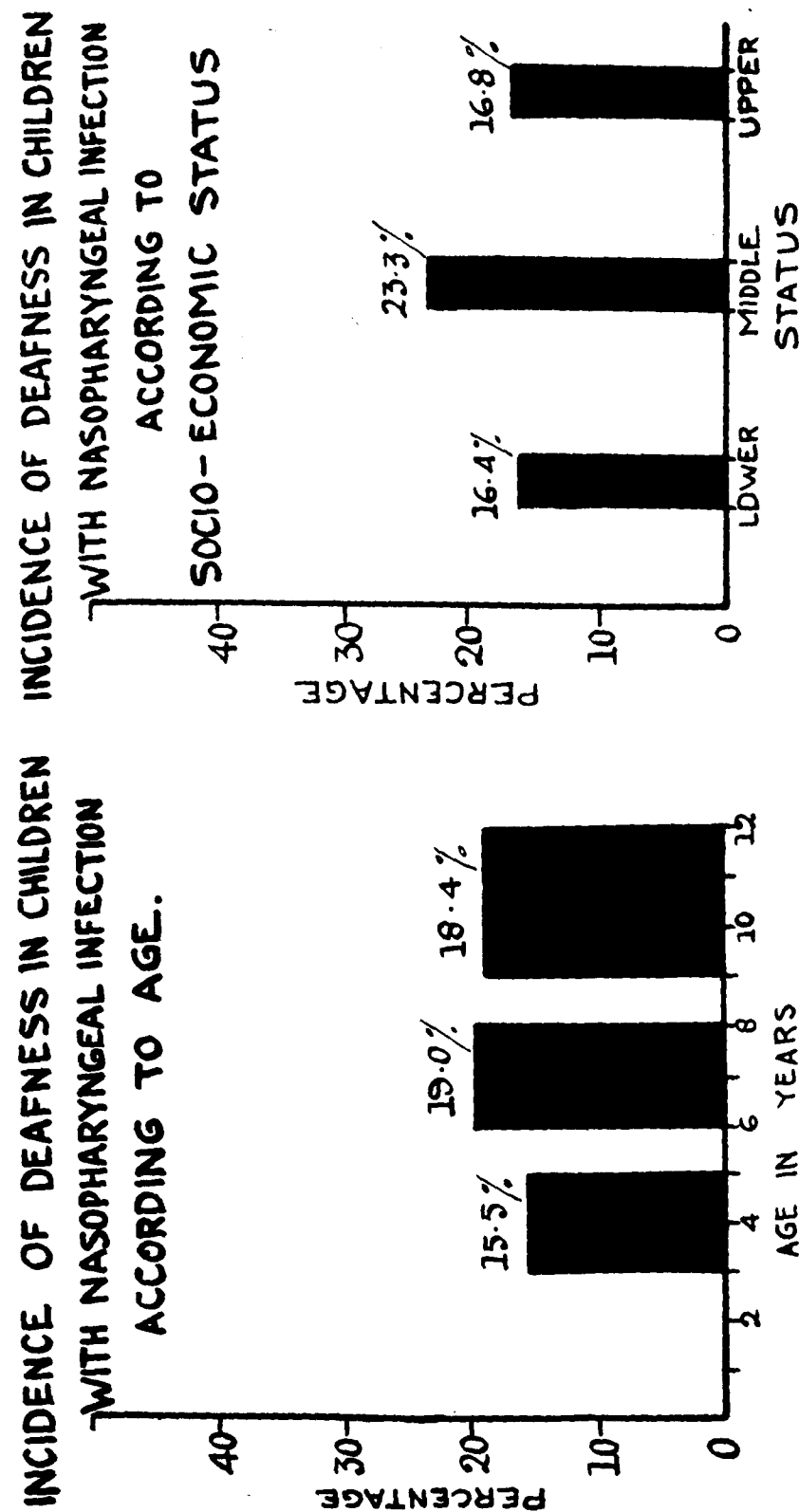


Fig. 5

DISCUSSION

We have incorporated the Board of Education Committee's (1938) recommendations for assessment because of the advantage it gives us for the purpose of training. Since for training and education grading of deafness is extremely essential.

Thus grading has been done in the following manner:

Grade I.—Partial deafness (slight)—a large number of children were found in this group. In most of the cases, this hearing loss is remediable and temporary. Many cases need and are cured by medical treatment. They are included in this group.

Grade II.—When hearing loss was found to be such that children could not hear a conversational voice in an average length of a class-room. They were graded as Grade II. Such children benefit by one or all of the following methods:—

1. A more favourable position in the class-room.
2. Lip reading instruction.
3. Hearing aid.

It is in this group that speech defects occur and they must be corrected by properly instituted speech therapy.

In this group, the following points are to be noted during progress in a class session.

1. Most of them are adjusted in a normal atmosphere. They are classified in Grade II-A.
2. Those who are not able to adjust inspite of the above mentioned methods being applied are classed as Grade II-B.
3. It is important that a teacher of the deaf and an Otologist should examine such children at regular intervals of at least six months.

A child who is classified as Grade II-B cannot however be placed in the Grade III since he does not require education by

the methods for the deaf. A child who has acquired speech by the normal method must not be classified with children whose hearing is so far gone as to make normal methods of acquiring speech impossible. These children in Grade II will fail to make progress due to:—

- (a) Inadequate rehabilitation.
- (b) Subnormal mentality.

Grade III Total deafness— a child who is so deaf as to be unable to acquire speech is classified in Grade III. This group will include the deafmutes.

(c) *Incidence of deafness and its causation.*—Incidence of deafness— — —

(i) *According to age.*—Grade I deafness was present in 436 cases making an average of 31·6 percent, varying from 39·8 percent in the youngest to 28·6 percent in the eldest children. Thus showing that the remediable deafness of Grade I shows a spontaneous regressive trend which if helped by modern medical means can considerably reduce its incidence.

Grade II deafness was found in 40 cases making an average of 2·9 percent. Thus one in every thirty children in our schools require special attention from the point of view of hearing. This is a considerable amount. It is also seen that though there is not a single Grade II case in the youngest children the percentage of Grade II deafness rises to 4·8 percent in the eldest. We thus find that part of the Grade I cases as they grow old become normal and a fraction of them deteriorate and pass into the Grade II variety. It is here that the preventive aspects discussed later come into play.

Happily there was not a single case of Grade III deafness in all our subjects.

(ii) *According to sex.*—There was no significant difference between the incidence of deafness in the males and females both in Grade I and Grade II classes of deafness.

(iii) *According to Socio-economic status.*—This gives us very enlightening information. Grade I deafness rises with the status, whereas Grade II deafness falls with the rise in socio-economic status. These inversely propositional results are easily explained on the following grounds. Firstly that children enjoying higher status in society suffer more from nasopharyngeal infection than children not so privileged; this is because their resistance to infection is low. Secondly children coming from economically higher back-grounds grow up in healthier and cleaner surroundings than children from low socio-economic status. Thirdly children whose parents can afford treatment are treated in time, and their maladies do not go far before they are checked. Thus we have an astounding difference of 7·3 percent in Grade II deafness, between children of upper socio-economic status and low socio-economic status. The incidence being 7·8 percent in the poor and 0·5 percent in the rich. Grade I deafness being 29·6 percent in the poor and 35·9 percent in the rich.

Causation of Grade I deafness—The common causes of Grade I deafness are three—

Wax.

Middle ear disease.

Nasopharyngeal infection.

Wax was found to be of the order of 66·7 percent in the youngest children to 38·1 percent in the oldest children. Thus we note a falling trend as the child grows. We also find from this that not all subjects with wax have deafness.

Middle ear disease was fairly constant in all age groups, rising from 14·4 percent in the youngest to 14·9 percent in the oldest. A total of 191 cases and an average of 13·9 percent among all subjects examined. But it showed interesting findings in relation to socio-economic status, it was found that whereas only 9·4 percent of the rich suffered, 20·2 percent of the poor suffered from middle ear infection.

Our findings do not agree with those of Crowe (1944) who states that almost 40 percent children between the age of 8-14 years show impairment of the threshold of hearing due to eustachian tube infection. Our figures indicate only 296 cases averaging 19.6 percent. Thus in our series the incidence of deafness due to nasopharyngeal infection is almost half of that in the series of Crowe.

(f) *Social and Preventive aspects.*—The hygienic surroundings and location of a large percentage of our schools leave much to be desired. We have to say this especially in regard to the Municipal Free Schools where conditions are far from desirable. According to annual enumerations by the Municipal Board of Lucknow City, there are about 62,000 children; out of these 50,000 are on rolls of all the schools of Lucknow. Of these 50,000 children many do not attend schools. According to a survey of truancy by the Indian Conference of Social Work conducted in 1957, the percentage of truant children was as heavy as 29.16 percent in certain Municipal Schools (National Herald 1959).

According to the above survey most children skipped school due to the dull, drab and depressing atmosphere in the schools, which are housed in dirty tumbling structures, with two and more classes crammed in the same room without furniture and nothing better to sit on than jute mats spread on the damp floor; without satisfactory sanitary arrangements and staffed with overworked low paid teachers working under heavy strain and with little interest in the children (National Herald 1959). These factors influence, in the following ways the hearing of our children :—

1. There is a rise of pollution of the atmosphere in the class room.
2. This causes a nasopharyngeal infection.
3. Nasopharyngeal infection leads to an infection of the middle ear.

4. Middle ear infection causes deafness as evidenced by 20.2 per cent middle ear infection in the poor compared to 9.4 percent in the rich. Deafness being high, thus 7.8 per cent Grade II deafness was found in children attending free schools and 0.5 per cent in children attending schools in which fees were paid by the parents.

Happily things are different in other schools and where we have sore spots we also have certain schools which approach the ideal in our city. Children are placed in healthy surroundings in these schools and proper care is taken regarding sanitation and hygiene. The spirit of cleanliness is infused among them and they grow up into healthy individuals free of all defects caused by bad hygiene including the effects of a discharging ear and deafness.

We suggest the following minimum required for the institution of a HEARING CONSERVATION PROGRAMME for our city in particular and for the country in general.

(1) *Facilities.*—(a) There should be at least one Otologic Surgeon attached to every school health service who should have at his disposal an outpatients department equipped with necessary instruments for the examination of the ear, nose and throat and also instruments for assessing the deafness of pupils in a sound proof room. Every child should be examined on admission and at regular intervals of at least one year duration.

(b) The surgeon should be placed in charge of a certain number of indoor hospital beds which should be at least 20 in number. These beds would enable him to carry out operative and corrective treatment after his examination of children. Thus he would be able to treat the cause of deafness in children and prevent it in other children who are at present normal but prone to get it.

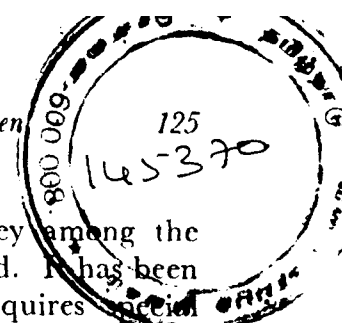
(c) Attached to this Clinic should be Health Visitors, Audiologic Technicians and Teachers of the deaf, who will help the deaf child to rehabilitate in the society.

(2) *Contact between parents and doctors.*—Parent Teachers Association are running in a certain number of our schools. It would be a great help if such associations are opened at every school, where once every month parents and teachers meet and discuss the problems of their children. The Otologist should be invited to these meetings once in a while, where he can advise parents and teachers on the handling of deaf children and also on its preventive aspects. This would inculcate a spirit of understanding in the parent and also would be a great step towards mobilisation of their cooperation in the treatment and prevention of deafness in our school going children.

(3) *Factors in hygiene*—

- (a) If children are brought up in a clean and healthy atmosphere it would be a great step on the conservation of normal hearing and in the increase of regression in the remediable stages of deafness.
- (b) Teachers should be able to impart instruction to children on the care of their ears, nose and throat. Such cleanliness would help in the preservation of normal hearing.
- (c) A running ear is normally lightly taken by parents. It will, with proper instruction be able to induce the correct amount of worry in the parent so that he may be enabled to take the child to an Otologist for treatment. This is only one factor, there are many other diseases in children, which directly or indirectly affect their hearing. A spirit of understanding about their magnitude and effects will definitely lead to a regression of deafness among our masses.

Needless to say the enquiry has shown that the place to start work is right at the bottom of the ladder and much is required to be done before the minimum can be achieved.



SUMMARY

The method and results of a sample survey among the 50,000 school children of Lucknow are presented. It has been found that one in every thirty school child requires special attention from the point of view of hearing. This is a considerable amount and works to a total of one thousand six hundred and fifty children in the schools of Lucknow. Wax, Nasopharyngeal infection and Middle ear disease were found to be the most common causes of deafness. The social and preventive aspects of the problem are discussed and ways and means, are suggested to overcome those neglected aspects of hygiene in school children which affect their status of hearing.

ACKNOWLEDGEMENT

The authors wish to express their gratitude to the State Medical Research Council under whose auspices the survey was conducted, to the Health Officers of Lucknow, the Principals and Head-Mistresses of the Schools of Lucknow, and lastly to the parents and school children of Lucknow without whose help the work would not have been as complete as was possible.

REFERENCES

1. Board of Education Committee: Report on children with defective hearing. London H. M. Stationery Office (1938) Quoted.
2. Crowe, S. U. (1944): Ann., Otol., etc., St. Louis 53, 227, 1944.
3. Glorig, A. & Wheeler, D. E. (1955): Historical record of the Wisconsin State Fair Hearing Survey, Noise Control 1: 18-25, 1955 Quoted in A. M. A. Archives, Otol., etc., 67, 69-70, 1958.
4. Goldberg, H. R. (1956): Coates, Otolaryngology, 1, 7, pp-41, 1956.
5. Hienemann, W. (1955): Diseases of the ear, nose and throat in Children, Butterworth, 1955.
6. Kerridge, P. M. (1940): Journal of Laryng. 53, 38, 1940.
7. National Herald (1959): September 28, 8, 1959.
8. O'Neill, J. J. and Grimm, W. A. (1958): A. M. A. Archives, Otol., etc., 67, 6900, 1958.
9. Seth, G. and Guthrie, D. (1935): Speech in childhood, London, Oxford University Press, Quoted by Whetnal E. (1952).
10. Silvermann, R. S.: Hearing and Deafness, A guide for Laymen Quoted by Keaster, J., 1947.
11. Whetnal, E.: Diseases of ear, nose and throat, Brown W. G. S. Butterworth, 1952.
12. Yearsley, M. (1934): Brit. J. Child Dis. 31, 177, 272, Quoted by Whetnal, E. (1952).

(English Translation)

E. N. T. DEPARTMENT

KING GEORGE'S MEDICAL COLLEGE

LUCKNOW

School Father's Name

Name of the Child

Age of the Child *Home Address*

- | | | |
|---|-----|-------------|
| 1. Does your child hear less | ... | Yes/No |
| 2. If the answer to the first question is less, when was the hearing loss first noticed? | ... | at age..... |
| 3. When you call the child from another room does he respond? | ... | Yes/No |
| 4. When the child's back is towards you, and you call him. Does he respond? | ... | Yes/No |
| 5. Has your child ever suffered from high fever for more than ten days. What was the diagnosis of the disease | ... | Yes/No |
| 6. Has your child ever had ear discharge | ... | Yes/No |
| What was his age at that time? | ... | at age..... |
| 7. Does your child often suffer from sore throat? | ... | Yes/No |
| 8. Has your child ever had small pox. If so | ... | Yes/No |
| then what was his age at that time | ... | age..... |
| 9. Can your child speak clearly and frequently | ... | Yes No |

(Please delete whatever is not applicable. Kindly answer the rest of the questions and return the questionnaire. Thanking you).

Yours faithfully,

R. N. MISRA, M.S., D.L.O. (Lond.),
Head of the Deptt. of E. N. T. Officer-In-Charge.
State Medical Research Council Scheme on
"Investigations of hearing in School Children".

No. _____ Date _____

Age Group.....

DEPARTMENT OF OTOLARYNGOLOGY

K. G. MEDICAL COLLEGE

LUCKNOW

INVESTIGATIONS OF HEARING IN SCHOOL CHILDREN

Name Age Sex

School.....Address.....

Complaints of Hearing loss..... If so age of detection.....

Past History

HISTORY

- 1) Educational attainment **Exceptional / Normal / Poor**
- 2) Speech development **Normal / Defective**
- 3) Hearing response
- 4) Lipreading **Proficiency**
- 5) Socio-economic **Status**

PHYSICAL EXAMINATION

- | | | Right | Left |
|-----|----------------------------------|-------|------|
| (a) | General Examination | | |
| | (1) Growth Normal / Stunted | | |
| | (2) Behaviour Quiet / Aggressive | | |
| | (3) Handedness Left / Right | | |
| (b) | Local Examination | | |
| | (1) Nose & Nasopharynx | | |
| | (2) Pharynx | | |
| | (3) Sinuses | | |
| | (4) Eyes | | |
| | (a) Local Examination | | |
| | (b) Vision | | |
| (5) | Ear | | |
| | a. External auditory canal | | |
| | b. Tympanic Membrane | | |
| | c. Discharge | | |
| (c) | Special Examination for hearing | | |
| | (1) Colour naming | | |
| | (2) Counting pieces | | |
| | (3) Picture Pointing | | |
| | (4) Speech reception | | |
| | (a) Normal Speech | | |
| | (b) Amplified Speech | | |
| (5) | Pure tone | | |
| | (a) Tuning fork tests | | |
| | (b) Audiogram | | |

Grade and Assessment:

Otomycosis

A CLINICAL AND MYCOLOGICAL STUDY

(Preliminary Report)

BY

ACHYUTANANDA SINHA, M.S., F.R.C.S., D.L.O.*

AND

L. N. MOHAPATRA, M.B.B.S., M.D. (Pat.), D.Bac. (Lond.)*

INTRODUCTION

Otomycosis known under various synonyms as mycotic otitis externa, Singapore ear, Hot weather ear etc. implies fungus infection of the ear. Clinically it is a chronic or subacute infection of the external auditory meatus and ear canal, from which a number of fungi and bacteria can be isolated. It is neither an uncommon nor a serious disease but is observed frequently in tropical and subtropical climates.

In clinical practice in Delhi area quite a number of cases of Otomycosis were encountered, particularly during the warm and humid months of July - August. It was felt that a clinical study supported by mycological study may be undertaken as a preliminary to more detailed etiological study as to the cause and effect relationship.

A series of 141 cases of otomycosis studied during the period July 1960 to February 1961 have been reviewed. During the said period a total of 4190 cases attended the E. N. T. clinic. Of these external otitis was diagnosed in 193 cases (4.67%), while otomycosis was diagnosed in 153 (3.67%). 12 cases were considered unsuitable for inclusion in the series for various reasons. Gill (1942) stated that otitis externa forms 5 to 40% of

cases of ear diseases attending Otolological Clinic. The incidence of otitis externa as a group was comparatively less in our series.

The fungi said to cause otomycosis are numerous but the relative frequency of the strains isolated varies from place to place. Wolf collected 53 species from the literature of which the predominant ones were aspergilli (90%) *Penicillium*, *Candida* and *Mucoraceae*. Conant et al (1945) mentioned that the fungi commonly seen in majority of cases are *Aspergillus*, *Penicillium*, *Mucor* or *Rhizopus*. Fowler (1948) mentioned that *Pityrosporon* is the commonest fungus in this disease. According to him *Aspergillus* rank second in frequency.

Mayer was the first to draw attention to infection of the external ear by fungi as early as the middle of the nineteenth century. But it is not quite clear as to what exact etiological relationship exist between the fungus present and the otitis externa in such cases. The current opinion is that fungi only get a chance when conditions are favourable, such as, presence of moisture and a slight existing inflammation of the external ear may favour the growth and inflammation due to fungi. Wolf and Castellani assert that inflammation can be caused by toxins secreted by the fungus.

MATERIALS AND METHODS

The present study was conducted on cases attending the O. P. D. of the department of Otolaryngology at the All India Institute of Medical Sciences, New Delhi during July 1960 to February 1961. In the series the cases were clinically diagnosed as otomycosis on basis of presence of symptoms of itching, pain, deafness and tinnitus and colonies of fungi growing in the external auditory meatus. The colonies had variable naked eye appearances. Sometimes they looked as dew-specks over the skin of the meatus which may have any of the following colours: brown, black or grey, or greyish black and sometimes of chalky white appearance looking like a fluff of wool or moist blotting paper. The symptoms as observed in the present series were as follows:

*From the Departments of Otolaryngology and Bacteriology, All India Institute of Medical Sciences, New Delhi.

Itching 85%; Pain in the ear 70%; Deafness and tinnitus in 70%; Discharge from the ear in 13% and associated symptoms of nose or throat were present in 11%. In most of the cases more than one symptom were present.

After history and physical examination of the suspected cases were recorded on a prepared proforma, ear swabs were collected and despatched to the laboratory for mycological study. Two sabourauds glucose agar slants were inoculated with each swab at 25°C and 37°C separately. The culture tubes were held for atleast two weeks before being discarded as negative. Of the 141 cases suspected clinically as otomycosis 20 did not reveal fungus in the first culture and did not turn up for subsequent examination. From the rest *i.e.* 121 cases 200 samples yielded positive mycological cultures.

The tubes yielding growth of fungus were separated for further observation and for final identification of the fungus. The aspergilli strains thus isolated were subcultured on Gzapek's medium for final identification according to the plan ordered by Thom and Raper.

Epithelial debris obtained from the cases were placed on a slide in a drop of 10% KOH Solution and examined for the presence of mycelium and spore.

No special attempt was made to isolate and study the bacterial flora in these cases but bacterial colonies coming up on the sabouraud's slant were picked up and studied for identification in the usual way.

PRE-DISPOSING FACTORS

The largest incidence of the cases was seen in the warm and humid months of August, September and October as will appear from table I.

TABLE 1—Showing Temperature and Humidity

Month	No. of cases	Mean Temp.		Mean Relative Humidity	
		Max.	Min.	08:30	17:30
July	19	34.6	27.1	77	63
August	54	32.6	26.1	84	74
September	20	35.0	25.3	69	50
October	27	32.0	18.8	64	48
November	9	27.9	11.6	56	37
December	4	23.7	8.5	63	42
January	2	21.4	8.3	80	51
February	6	21.2	9.0	71	41

It will be noted that there is a sudden drop in the number of cases seen in November as compared to those seen in October. The drops in Temperature and Humidity between these two months is also correspondingly significant. It will appear that a mean average temperature above 25°C and mean average relative humidity above 56 is conducive to the increase in incidence of otomycosis.

The occupation of the patient observed in the series has no special relationship to the incidence of the disease.

The disease affects the patients of all ages and both sexes. The ratio of male to female in the series was 5:4. The age incidence in the cases observed was as in Table 2.

TABLE 2—Showing Age Incidence

Age	No. of cases	% (approx)
0 – 10 years	9	6%
11 – 20 years	33	23%
21 – 30 years	50	36%
31 – 40 years	19	13%
41 – 50 years	11	8%
51 – 60 years	9	7%
61 – 70 years	46	4%
71 – 80 years	4	3%

The disease was noted to be unilateral in 63 cases and bilateral in 35 cases.

The habit of using oil as drop in the ear on the slightest excuse of pain or irritation would seem to be a predisposing factor. This view is in agreement with those of Kanlvin quoted by Dart. This habit was noted in as many as 90% of the cases in the present series. The exact mode by which dropping of oil in the external ear may predispose to fungus infection is not clear. Inoculation of culture media by the suspected sample of oil yielded no growth. It will appear that the excess of greasiness in the external meatus favours the deposition of the fungus from the atmosphere for inoculation by the finger.

In 13% of cases the fungus infection was noted in association with wax in the ear.

Another factor noted in the series that may predispose to fungus inoculation was the habit of scratching and cleaning the ear canal. This may be done by foreign objects like match stick, metal stick made of nickel, hair pin or even by finger. This practice was noted in as many as 85% of the cases observed.

It will be significant to note that no history or practice of swimming was obtainable in the cases of the series, nor was the habit of periodic washing of the ear noted.

MYCOLOGY

As stated above 200 samples of ear swab yielded positive results. The strain of fungi isolated from these were as follows :—

TABLE 3—Showing Mycological Findings

Strain	Incidence	
	No.	%
Strains of aspergilli	158	81.5%
Strains of Penicillium	4	2%
Strains of Candida	18	9%
Strains of Miscellaneous	14	7%
Fungi Imperfecti		
Strains of mucoraceae	1	0.5%
Total	195	

It will be seen that aspergilli accounted for the majority of the cases being followed by Candida and Penicillium, in that order.

These main groups were further analysed as given in the following :

TABLE 3-a—Showing Mycological Findings

		No. of strains	
Aspergillus	Aspergillus niger group	...	80
	Aspergillus fumigatus group	...	50
	Aspergillus terreus group	...	11
	Aspergillus candidus group	...	8
	Aspergillus glaucus group	...	5
	Aspergillus nidulans flavipes group	...	4
Total		...	158
Candida	Candida albicus	...	5
	Candida tropicalis	...	4
	Candida Krusei	...	3
	Candida gulliermondi	...	1
	Candida Sp. (Not identified)	...	5
Total		...	18
Miscellaneous Group			
	Mucor	...	1
Fungi Imperfecti			
	Alternaria Sp.	...	1
	Curvulavia Sp.	...	6
	Cephalosporium	...	2
	Horniscium Sp.	...	1
	Fusarium Sp.	...	1
	Helminthospori Sp.	...	2
	Heterosperium Sp.	...	1
Total		...	14

Besides the fungi the following bacterial strains were also isolated and as stated earlier these were not studied in any detail:—

1. *Ps. pyocyaneus*.
2. *Staphylococcus aureus*.
3. *Staphylococcus albus*.
4. *Micrococcus*.
5. *Diphtheroids*.
6. *Coloform organisms*.
7. *Aerobic spore-bearers*.

DISCUSSION

In the series under study whereas otitis externa was present in only 4.6% of the cases attending E. N. T. Clinic, 3.6% of these cases were diagnosed clinically to be otomycosis. This will appear to be an unusually high incidence. It may be due to the fact that simple otitis externa does not draw enough attention of most people in this country so as to bring them to a hospital. It is chiefly when they are complicated with fungus infection, for instance, that they attend a hospital. It may also be noted that the otitis externa secondary to middle ear infection has not been included in the above figures.

The seasonal incidence shows preponderance during the months of extreme heat and moisture. Injury to the skin of the External ear canal will appear to be an important factor. This may be done by scratching ear with metal stick or similar objects. This was noted in 85% cases. It is possible that such trivial injury set up slight inflammation which in presence of moisture favours growth of fungi. The clinical features noted in the series are similar to those of Thone or Connant. It will be seen that the commonest presenting symptom is itching and pain.

As noted earlier in 13% of the cases of the series fungus infection was noted in association with wax in the ear. It has been suggested that wax has got fungostatic property. (Konigsbauer et al 1958) Fungostasis was said to be strong or complete for *Trichophyton gypseum* and *rubrum* and moderate or weak for various *aspergilli* strains, while there was no action for yeast. The protective effect of the cerumen against otomycosis is based on physical and chemical factors. It is said that half liquid, fatty cerumen gives both optimal protection of the surface and the best fungostatic effect. Dry, hard pieces of cerumen are as a rule not effective fungostatically and do not offer sufficient protection physically to the auditory canal walls. These observations tally with those met with in the series. The wax in the ear occurs all round the year and perhaps it offers its protective action. On the other hand when it has dried up during dessication of the summer months of May & June it may have lost its protective action. In July-August-September when the humidity increases with the warmth of the atmosphere, fungi seem to find an easy foot hold. This will explain the greater incidences of otomycosis in these months. However, from the fact that only 13% of the cases of the series had association with wax one cannot say that wax has any important etiological role. Apart from the physical factors referred to it will not appear justified to ascribe the cerumen with any fungstatic property. Some authors did not find cerumen in otomycosis. In the present series, however, besides cerumen being present, the fungus were actually observed growing on the cerumen in several cases. *Aspergilli* were isolated from wax in such cases. This observation is in agreement with those of Trimachai quoted by Dart and of Conley.

The exact mode whereby the symptoms are caused is not clear. It is possibly due to irritation caused by the mere presence and growth of the invading fungi. Wolf and Castellani (quoted by Dart), however, assert that inflammation can be caused by the toxin secreted by the fungus.

Mycological observations of Wolf, Conant and Fowler have been noted earlier. Sharp et al studied 40 cases of otomycosis clinically and morphologically. Nearly all culturally positive cases contained *Aspergillus niger* or *Flavus*.

Syvertson et al studied 50 patients presenting 72 ears diagnosed clinically as having otomycosis and found *Aspergillus* and *Candida* species predominant among fungi and *Pseudomonas*, staphylococci, diphtheroids and micrococci as preponderant bacterial agents in their series.

In the present observation *Aspergillus*, *Candida* and *Penicillium* species accounted for the majority of positive cultures. Among the bacterial strains *Pseudomonas pyocyaneus*, staphylococci, micrococci and diphtheroids were the most common ones isolated.

However, the significance of the various fungi isolated remains difficult to evaluate in these clinically diagnosed cases of Otomycosis. The exact part played by the fungus in the morbid process remains unknown. It may be (i) that the fungus is the true etiological factor responsible for the inflammation, or (ii) the fungus may be a facultative, parasite, which in special instances may aggravate the morbid process, e.g. trauma, excess moisture, pre-existing inflammation of the ear canal, or dry wax, or (iii) the fungi may be mere saprophytes living in the ear canal, when their presence may be demonstrated in patient without any symptoms.

It is proposed that the observations on the above lines will be continued and significant observations be reported in future communication.

SUMMARY

1. 141 cases of Otomycosis have been studied clinically and mycologically.
2. 195 cultures put up yielded growth of fungus: of these 81.5% were aspergilli, 9% were *Candida*, 2%

were *penicillium* and 7.5% belonged to miscellaneous group of fungi imperfecti.

3. Some aetiological factors have been evaluated like relationship to temperature and humidity, habit of using oil as ear drop, presence of wax in the ear, trauma to ear canal etc.
4. The literature has been briefly reviewed and the aetiological role of fungi in the morbid process has been discussed.

ACKNOWLEDGMENTS

The authors wish to thank the Director of the All India Institute of Medical Sciences for permission to carry out the observation on the patients attending the Institute hospital. They also wish to thank for the help and cooperation of the members of the staff of the departments concerned.

REFERENCES

1. Chisholm, J. T. and A. C. Sutton.: Arch. Otolaryng. 2, 543-556, 1925.
2. Conant, N. F. and others: Manual of Clinical Mycology Philadelphia, Sunder. 1955.
3. Conley, J. J.: Arch. Otol. 47: 721-745, June 1948.
4. Fowler, E. P.: Medicine of the Ear, 2nd Ed. Pub: Nelson (N. Y.) 1948.
5. Gile, W. D. et al: Quoted in Otolaryngology, Ed. by Coates, 1948.
6. Konigsbauer, H. et al: Mykosen (Berlin), Quoted by Excerpta Otol., 1958.
7. Kanlvin: Quoted by Dart, M.O., Arch. Otolaryng. 31, 385, 1940.
8. 1 & 9. Quoted by Senturia, Ben H.: Diseases of the External Ear Pub: Charles C. Thomas, 1957.
9. Sharp, W. B., M. B. John and J. M. Robinson.: Texas State J. Med. 42, 380-384, 1946.
10. Simon, R. D. G. 1954; Medical Mycology, Elsener Pub. Co. 1954.
11. Syvertson, J. T. et al: Arch. Otolaryngology, 43, 213-225, 1946.
12. Thone, A. W. 1954: In Medical Mycology, Pub: Elsevier Pub. Co., N. Y. 1954.
13. Wolf, F.: Arch. Otolaryngo. 46, 361-374, 1947.
14. Wolf & Castellani: Quoted by Dart, M. O. Arch. Otolaryng. 31, 385, 1940.
15. Gregson, A. E. W. and Touche, C. J. La.: Jour. Laryng. LXXV, 1, 45, 1961.
16. Ibid: Jour. Laryng. LXXV, 1, 167, 1961.

An unusual Manifestation of Scleroma

BY

Dr. O. P. GUPTA, M.S. (ENT), D.O.

AND

Prof. R. N. MISRA, M.S., D.L.O. (Lond.),

Department of Otolaryngology, K. G. Medical College, Lucknow.

The unusual feature of the case about to be described was palpable glands in the neck. Gland biopsy revealed invasion by granulation tissue typical of scleroma. So far as the authors are aware, no case has been reported in the literature of Scleroma producing metastases in the gland. A growth in the size of the cervical glands is occasionally produced in Scleroma cases which according to Szmurlo (1933) is due to secondary infection. Sercer (1925) however, describes a case of Laryngeal Scleroma with enlargement of prelaryngeal glands, from the juice of which typical K. Rhinoscleromatis were cultured. He also mentioned that Rona noticed enlargement of lymph glands in the neck and axilla in Scleroma cases and that on four occasions he was able to obtain pure cultures of the bacteria of Scleroma from these glands. Sercer (1925) believes that scleroma spreads by Lymphatics and bases this on the following observations made by him :—

1. The metastatic diffusion of bacteria of Scleroma in the glands draining the diseased area.
2. The local distribution of lesions of scleroma.
3. The symmetrical disposition of the infiltrates of Scleroma.



Fig. 1

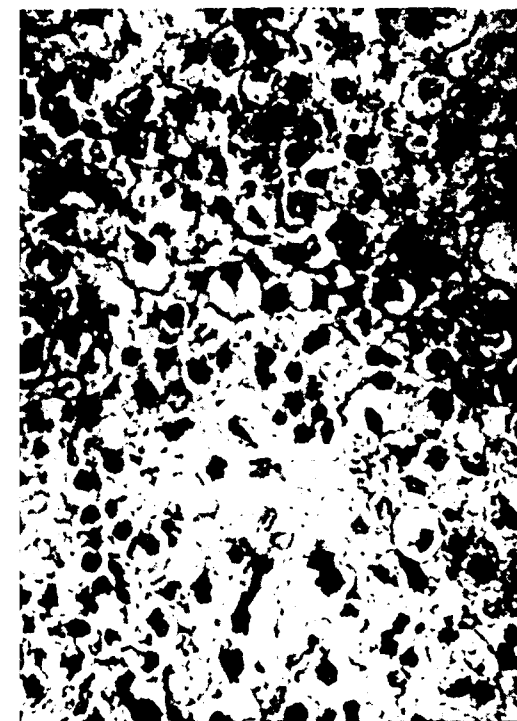


Fig. 2-a
Microphotograph under low magnification.

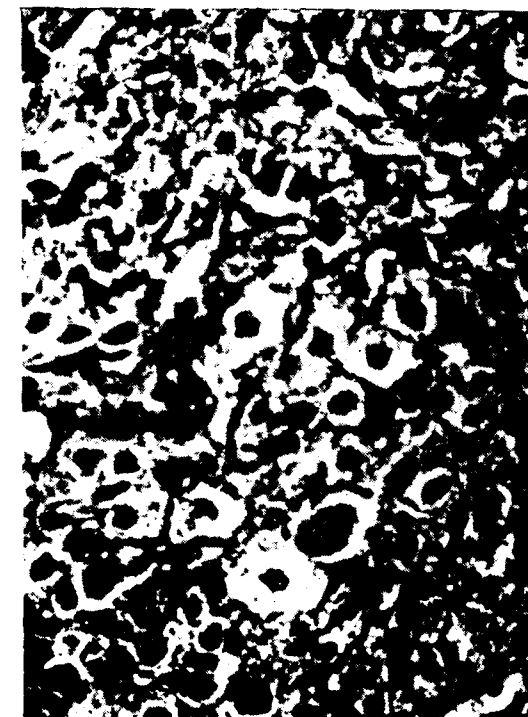


Fig. 2-b
Microphotograph under high magnification.

CASE REPORT

Patient R. D., Hindu, Male, aged 40 (Fig. 1) was admitted to E. N. T. wards on 18-3-'60, with complaints of

- Ulcerations in the soft palate ... 6 years.
- Difficulty in breathing ... 6 months.
- Difficulty in swallowing ... 6 months.

ON EXAMINATION

Contour of the nose distorted, and expanded in all directions. Nose was hard on palpation and both the nasal fossae were blocked by fleshy masses hard in consistency. Post rhinoscopy was not possible, as Nasopharynx and Pharynx were involved resulting in adhesions between the soft palate and posterior wall of the pharynx causing narrowing of the nasopharyngeal and oropharyngeal isthmus. Pillars were fibrotic, pulling the base of the tongue upwards. Soft palate showed ulceration and destruction of uvula. Indirect Laryngoscopy was not possible. Cervical glands in the neck were palpable especially one almond sized jugulo-digastric gland on left side which was removed for biopsy. Tuberculin test-negative. Cardio-vascular and respiratory system-Normal.

BIOPSY REPORT

*Description of Gross—Gland—*One piece of tissue measuring 3 × 2 cm. received. Whole has been sectioned.

HISTOLOGICAL EXAMINATION

Section shows fibro-muscular tissue invaded by granulation tissue which shows large number of plasma cells, lymphocytes and a few Mickulics cells (Fig. 2).

COMMENTS

Putschowsky as quoted by Eggston and Wolff (1947) made a statement after observing 700 cases that quite a few of his patients with Scleroma had tuberculosis of other organs, particularly of the cervical glands. In this patient tuberculin test was negative and chest examination revealed no abnormality of lungs and heart.

The involvement of lymph gland in this particular case lends support to the view expressed by Sercer (1925) that Scleroma spreads by Lymphatics. We do not know if Sercer or any one else has made any mention of Scleroma granulation tissue in gland biopsies. The authors therefore think that this manifestation of Scleroma is very unusual and merits attention. The ulcerations of the soft palate in this patient were probably due to effects of mastication, for the scleroma lesions do not ulcerate unless traumatised.

REFERENCES

1. Sercer, A.: *Acta Otolaryngologica*, 8: 308, 1925.
2. Szmurlo (1938) Quoted by Wahi, A. L.: 'Scleroma' thesis for M. S. (E. N. T.) Lucknow University, 17: 1957.
3. Putschkowsky, A.: *Arch. Otolaryng.* 18: 396, 1933.

A Case of Congenital Dermoid Cyst of the Nose

BY

LEELAVATHY & MUKUNDAN,

*Stanley Hospital, Madras.***EMBRYOLOGY**

Two views have been put forward regarding the embryology of the dermoid cysts of the nose. According to some, during the fusion of the segments which form the external nose, an epithelial pearl of skin or mucous membrane gets isolated and gives rise to the dermoid cyst. Others maintain that a dermoid cyst simply develops because the bilateral segments which should unite to form the facial structures fail to do so completely.

PATHOLOGY

The wall of the cyst consists of fibrous tissue lined by stratified epithelium containing epithelial cells, sweat glands, sebaceous material, Cholestrin crystals and hair.

SITE

They may arise at the junction of the primitive septum of the primitive palate (from the frontonasal process) with the definitive septum of the tectoseptal process (from the maxilla), sides of the nostrils, glabella, tip of the nose and along the dorsum. A case of a dermoid cyst arising between the two nasal bones is given below.

K, male, aged 12, was referred to the E. N. T. department of Stanley Hospital, Madras on 24-6-61 from the Railway Hospital with a complaint of swelling over the front of the nose, frequent attacks of pain and intermittent discharge through an opening below the swelling. The swelling was present from the time of birth and has been gradually increasing in size.

On examination, there was broadening of the bridge of the nose with a swelling situated in the midline and beneath the two nasal bones, with its centre between the inner canthi, $\frac{1}{2}$ " $\times$ $\frac{1}{2}$ ", no signs of inflammation, skin was freely movable over the swelling, and a small deficiency of the bone could be felt on the left side of the midline. A small dimple could be seen $\frac{1}{2}$ " below the lower end of the swelling in the midline, through which 4-5 small hairs were projecting out (Fig. 1 and Fig. 2).

Examination of the nose did not reveal any abnormality. Xray of the nasal bones did not show any pathology and Xray after injection of Lipiodol through the dimple was also not of any help.

On 4-7-61, the patient was complaining of pain over the swelling and on examination, the swelling was slightly increased in size, tenderness was present and on pressure over the swelling, a thick yellow fluid was coming out through the dimple. He was treated with antibiotics and the pain disappeared after three days.

The patient was operated on 17-7-61 under endotracheal gas and oxygen anaesthesia. A transverse incision 1" in length, with its centre in the middle of the swelling and ends curving downwards on either side was made (Transverse incision was decided upon for cosmetic reasons) and soft tissues cut through upto the periosteum which was elevated. The nasal bones were found to be separated from each other and the capsule of the cyst could be seen through the deficiency between the nasal bones. The cyst was dissected along the capsule as far as possible. As dissection of the capsule was not possible further back on the sides and posteriorly, the capsule was punctured at one spot and a cheesy material in which hairs were present came out. Evacuation of the contents made it possible to dissect out the entire capsule of the cyst. At the lower end of the cyst, a fibrous band was seen connecting the cyst with the dimple and it was removed along with the cyst wall and the

A Case of Congenital Dermoid Cyst of the Nose



Fig. 1



Fig. 2



Fig. 3



hairs projecting outside, which resulted in a small wound at the site of the dimple. After removal of the capsule, it was found that the ethmoids were diseased and they were curetted out. The nasal bones and the nasal process of the maxilla on either side were fractured inwards. Intranasal rubber drainage tubes in either nasal fossae were put, the incision was sutured and external splint was applied by Stent's Composition. The patient was put on antibiotics, the postoperative period was uneventful, the sutures removed on the 7th day and the splints were removed on the 18th day (Fig. 3 and Fig. 4). The small scar left behind was not very evident and the patient could conceal it with spectacles when necessary.

SUMMARY

A case of dermoid cyst between the nasal bones is presented along with a useful, though not conventional, incision for its removal.

REFERENCES

1. Goldis & Macbeth : J. L. O. 1955.
2. Crawford & Weleste : Plastic reconstg. Surg. 9, 235.
3. Kleshadt : Annals Otol. St. Louis, 1953.

An unusual case of Acute Monocytic Leukaemia with Otitis Media and Bilateral Facial Paralysis

BY

Dr. S. N. SINHA, M.S., D.L.O., R.C.S. (Head of E. N. T. Dept.)

AND

Dr. H. NAVANI, M.D., (Path). (Lecturer in Pathology)

G. S. V. M. Medical College, Kanpur.

Acute Leukaemia often presents a diagnostic problem, both to the clinicians and to the Haematologists, more so when the manifestations are unusual. It is further complicated when we realise that no fundamental difference exists between the primary tumour of lymphoid tissue and the leukaemia. Both groups of diseases are considered to be primary tumours arising from cells derived from primitive mesenchyme which may be divided for purposes of convenience into: -

(a) Those where the disease is manifested by characteristic peripheral blood and bone marrow changes with or without hepatosplenomegaly (Leukaemia).

(b) Those where peripheral blood and bone marrow changes rarely occur, and where there is characteristically, a lymphadenopathy with or without hepatosplenomegaly (Primary tumour of lymphoid tissue).

The present case is considered worth reporting on account of several interesting and unusual manifestations, in the form of bilateral facial paralysis, ear discharge, proptosis of eyes and lump in the right iliac fossa followed by characteristic peripheral blood changes of acute monocytic leukaemia. Unlike an usual case of leukaemia there was neither lymphadenopathy with hepatosplenomegaly nor peripheral blood and bone marrow changes of leukaemia when the patient was first admitted in the hospital.

CASE REPORT

This patient (M. L.) aged 16 years was admitted in L. L. R. Hospital, Kanpur on 7-1-60 with the complaint of severe pain in left ear of ten days duration. There was a history of loose motions for the past 6 months. Examination revealed him to be a weak pale young boy. A lump, firm, nontender with a nodular surface was found in right iliac fossa. Patient had no lymphadenopathy and hepatosplenomegaly.

E. N. T. EXAMINATION

Left drum presented with a nipple perforation and bulging of the Shrapnell's membrane with mucopurulent discharge. Mastoid tenderness was present on the left side. In addition left sided facial paralysis of infranuclear type was noticed. The right ear was perfectly normal. Weber's test was lateralised towards left side. Rinne's test was positive on right side but equal on left side. Romberg's, finger nose and past pointing tests were normal. Blood examination on 9-1-60 showed a Haemoglobin of 9 gms./100 ml., and total W. B. C. 6,400/cmm (Polymorphs 52%, lymphocytes 44%, monocytes 2% Eosinophils 2%). The red cells showed anisocytosis and poikilocytosis. He was treated with systemic antibiotics, haematinics and local antibiotic drops in the left ear. One week after admission he started having pain in the right ear. The ear drum was found congested. Next day right sided facial paralysis of the infranuclear type was noticed. There was pus in the right ear with central perforation of the drum. Nystagmus was more marked on looking towards right with conductive deafness in the right ear. Blood examination 18-1-60 revealed total W. B. C. of 18600/cmm. (Polymorphs 39%, lymphocytes 55% and monocytes 6%). The monocytes were particularly large with pale vacuolated cytoplasm.

He was treated symptomatically with antibiotics and was thought to be improving. However on 26-1-60 proptosis of both eyes was observed, accompanied with limitations in the visual

acuity. Funduscopy revealed bilateral papilloedema and haemorrhagic exudates which were more marked on the right side. On 29-1-60 he complained of inability to pass urine and weakness of lower limbs. Examination revealed distended bladder and paraplegia with extensor planter response. Blood count was repeated on 2-2-60. His total W. B. C. had risen to 55,600/cmm. and the differential count was altered to polymorphs 13% lymphocytes 17% and blast cells 70%. Morphologically the blast cells resembled to the monocytic variety. The cells showed a great pleomorphism in size and shape ranging from 12-20 μ in size. They were either of round configuration or irregular in outline due to pseudopodial projections. The nuclei were indented, horse shoe shaped or convoluted, composed of fine sieve like net-work of chromatin, enclosing 1-2 large nucleoli. The cytoplasm stained muddy greyish blue often showing vacuolation. Azure granules and an occasional Auer body in the cytoplasm left no doubt as to the nature of the blast cells. Peroxidase stain was faintly positive. Appearance of the peripheral film was consistent with Acute monocytic leukaemia. Haemoglobin had fallen to 3 gms%, R. B. C. showed marked anisocytosis and poikilocytosis. Liver and Spleen remained unpalpable. Lymphnodes were not enlarged. No haemorrhage in skin and gingival mucous membrane was observed. Now the patient was treated with cortisone, blood transfusion, haematinics and antibiotics. The blood count repeated ten days after the diagnosis of acute monocytic leukaemia showed a decrease of blast cells from 70 to 39%, otherwise there was no improvement. His condition deteriorated considerably and he died 6 days later on 19-2-60.

DISCUSSION

It is difficult to explain the unusual manifestations of this particular case but there is no doubt that bilateral facial paralysis, ear discharge and proptosis were definitely due to some intracranial deposits which, however could not be confirmed as

the permission for Post Mortem was refused. The case also presented a lump in the right iliac fossa with symptoms of loose motions. For the first 3 weeks in the hospital there was no appreciable peripheral blood changes. However there was rapid deterioration in the patient's condition and in blood examination it turned out to be acute monocytic leukaemia. Acute monocytic leukaemia is usually associated with petechial haemorrhages, mucous membrane changes, pyrexia, lymphadenopathy and hepatosplenomegaly⁶. None of these changes were noted in this case. Some other unusual manifestations have been mentioned by Wood (1960)⁷ as dermatosis, suspected ovarian cyst, agranulocytosis, thrombocytopenia, purpura, pernicious anaemia and nutritional anaemia but again these findings were lacking in this case. Whether the intracranial pathology and the mass in the right iliac fossa were part and parcel of one condition, monocytic leukaemia, or leukaemia is a coincidence over unknown pathological lesions at two different sites, is difficult to assess in absence of autopsy. It is not unusual for malignant reticulosis to manifest itself in any abnormal fashion. Leukosarcoma associated with lymphosarcoma, Chloroma with myeloid leukaemia and plasma cell leukaemia in multiple myelomatosis are examples of peripheral blood changes and localised tumours. Monocytic leukaemia or "Stem cell leukaemia" is known to be associated with reticulum cell sarcoma in different sites.^{1,2,3} Thus in this particular case all the symptoms might have been due to a localised malignant reticulosis while it was still in the aleukaemic state. Aleukaemic leukaemias are most frequently seen among the more rapidly fatal variety. Here also the aleukaemic picture changed into acute monocytic leukaemia with a high total leucocyte count of 55,600/- cmm. and monoblasts almost 70% ending fatally in a very short period. In view of the unusual signs and symptoms of the face and mass in the right iliac fossa being followed by acute leukaemia it is worth while to consider such a varied picture due

to a single pathological condition, that is, a multicentric reticulum cell sarcoma terminating fatally in acute monocytic leukaemia.

ACKNOWLEDGEMENTS

I am highly thankful to Dr. C. B. Singh, M.B., F.R.C.S., P.M.S., Principal and Senior Superintendent, G. S. V. M. Medical College and associated hospitals, Kanpur for permitting me to report this case. My thanks are also due to Dr. B. L. Agarwal, M.D., M.R.C.P. (Edin.) for his kind help.

REFERENCES

1. Campbell, A.C.P., Henderson, J. L. and Groom, J. A.: J. Path. Bact., 42, p. 617, 1936.
2. Gating, R. and Hawksley, J. C.: J. Path. Bact. 36, p. 115, 1933.
3. Haining, R. B., Kimball, T. S. and Jones, O. W.: Arch. intern. Med. 55, p. 574, 1935.
4. Lumb, G.: Tumours of lymphoid tissue, E. & S. Livingstone Ltd., p. 126, 1954.
5. Lumb, G.: Tumours of lymphoid tissue, E. & S. Livingstone Ltd., p. 127, 1954.
6. Whitty, L. and Britton, C. J. C.: Disorders of blood, J. A. Churchill Ltd., p. 542, 1957.
7. Webb, E. E.: Brit. Med. J., June, 1960.

Association Notes

INTERNATIONAL SEMINAR ON ARTERIOSCLEROSIS

Bombay 3rd, 4th & 5th February, 1962

K. E. M. HOSPITAL,
Bombay, 12

Papers are invited for the above Seminar which will cover all aspects of arteriosclerosis. Special Sessions will be devoted to the following subjects:

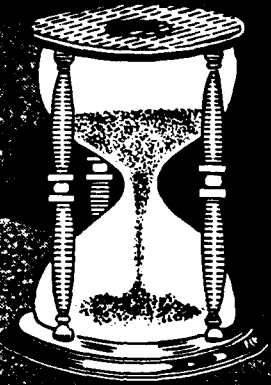
1. Cardiovascular Arteriosclerosis
2. Neurological Arteriosclerosis
3. Peripheral Vascular Arteriosclerosis
4. Experimental Arteriosclerosis
5. Panel Discussion on Arteriosclerosis, which will be of special interest to general physicians.

It may be possible to arrange for return air/first class rail fares for those whose papers are selected for presentation at the Seminar. In addition, they will stay in Bombay for the duration of the Seminar as guests of the Organising Committee. The last date for receiving summaries is December 1st 1961. They should be sent to:—

Jt. Organising Secretaries,
International Seminar on Arteriosclerosis,
K. E. M. Hospital, Bombay-12.

The last date for registration of delegates is December 1st, 1961. There is no registration fee, but early registration is advisable as otherwise it may be difficult for the Organising Committee to arrange for accommodation. As International celebrities are expected, the Seminar will be widely attended.

NEW



antihistaminic
preparation...

Anaryl

TABLETS

Rapid long lasting effect
Yet convenient & economical

ANARYL is also available in
painless INJECTABLE form...

LABORATORIES ORGASYN
260, Dr. Annie Besant Road, Bombay 18.

HEARING AIDS

All Transistorised
High Fidelity HEARING AIDS



Model "PRESIDENT"
and other varieties.

Noted for:

1. Quality Performance.
2. Miniature in size.
3. Economically priced to suit moderate and severe cases of loss of hearing.

SOLICITING YOUR KIND PATRONAGE

KINDLY CONTACT:

SINGH TRADING COMPANY

Grams: "PEKALIT"

9, Blackers Road

Phone: 85904

MOUNT ROAD, MADRAS-2

UNI U. C. B. (India) Pvt. Ltd.

22, BHULABHAI DESAI ROAD

BOMBAY-26

ATARAX

(Hydroxyzine Hcl.)

A mild tranquilizer without
side reactions

Now available Tabs. of
10 mg. and 25 mg. also
available in Syrup and Drops

LONGIFENE

(Bucizine Hydrochloride 25 mg.)

A long acting potent

Antihistaminic

(for Rhinitis and Pruritus)

Now available
Tablets

For further particulars, please contact:

M/s. GANAPATHY & CO.

103/104, Linghi Chetty Street

MADRAS-1