RESULTS

Study Group

Subgroup "A" - Infection group   (N = 15) i.e. (Their number was 15 subjects)

The mean age was 18.6 years of which 5 subjects were children below 12 years (33 %).

Table (1)

No. of subjects	No. of males	No. of females
15	12	3

Table (1) shows the number of females and males in group "A"

Table (2)

No. of subjects	% of males	% of females
15	80 %	20 %

Table (2) shows their percentage to the total number of

group "A"

Table (3)

Symptoms	No. of subjects complaining with it
1. Rhinorrhea	
a. mucoid	6
b. mucopurulent	1
c. purulent	5
2. Nasal Obstruction	
a. complete	1
b. intermittent	4
c. bilateral	10
3. Epistaxis	-
4. Crust Formations	2
5. Headache	1
6. Anosmia	9
7. Hearing Loss	-
8. Tinnitus	2
9. Ear Discharge	-

Table (3) shows the main symptoms of subgroup "A"

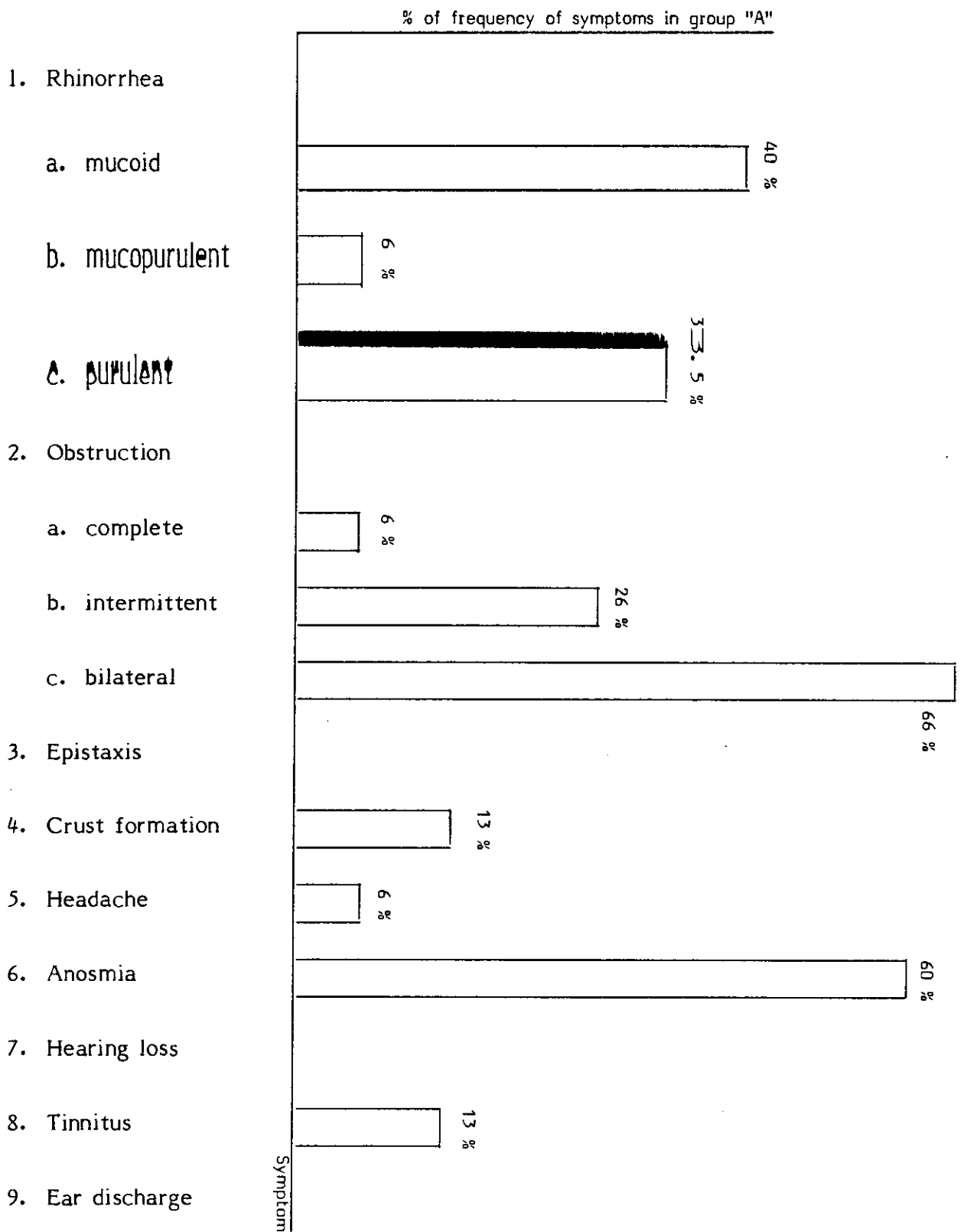and their frequency in the study subjects

Figure (1a)

% of frequency of symptoms in group "A"

1. Rhinorrhea

   a. mucoid — 40 %

   b. mucopurulent — 9 %

   c. purulent — 33.5 %

2. Obstruction

   a. complete — 9 %

   b. intermittent — 26 %

   c. bilateral — 66 %

3. Epistaxis

4. Crust formation — 13 %

5. Headache — 9 %

6. Anosmia — 60 %

7. Hearing loss

8. Tinnitus — 13 %

9. Ear discharge

Symptom

Table (4)

Nasal & nasopharyngeal signs	No. of subjects who have this sign
1. Mucosa	
a. congested	10
b. atrophic	2
c. hypertrophic	4
2. Septum	
a. deviated	5
b. spur	1
3. Meati ⟶ discharge	
a. mucopurulent	6
b. purulent	3
c. mucoid	2
4. Turbinates ⟶ Hypertrophy	
a. superior	-
b. middle	-
c. inferior	6
5. Adenoid Enlargement	3
6. Nasopharyngeal Mucosa (congested)	10
7. Discharge (post-nasal)	11

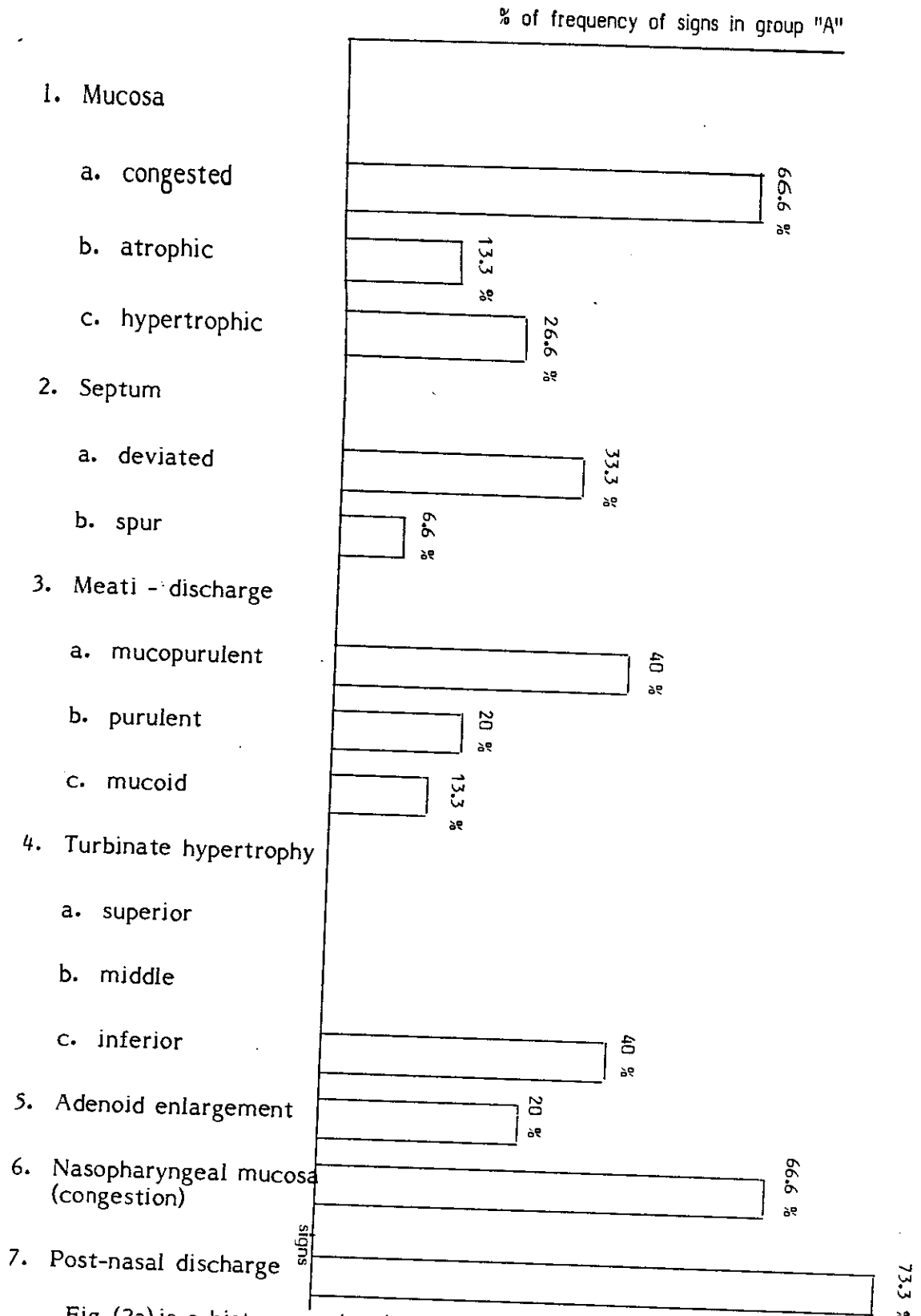Table (4) shows the main signs of subgroup "A"

Figure (2a)

% of frequency of signs in group "A"

1. Mucosa

   a. congested

   b. atrophic

   c. hypertrophic

2. Septum

   a. deviated

   b. spur

3. Meati - discharge

   a. mucopurulent

   b. purulent

   c. mucoid

4. Turbinate hypertrophy

   a. superior

   b. middle

   c. inferior

5. Adenoid enlargement

6. Nasopharyngeal mucosa (congestion)

7. Post-nasal discharge

66.6 %

13.3 %

26.6 %

33.3 %

6.6 %

40 %

20 %

13.3 %

40 %

20 %

66.6 %

73.3 %

signs

Fig. (2a) is a histogram showing the percentage of frequency

Table (5)

Ear signs	No. of subjects who have this sign
1. Loss of cone of light	14
2. Retraction of the drum	12
3. Perforation of the drum	-
4. Congestion of the drum	-
5. Mobility of the drum	
a. mobile	9
b. immobile	6

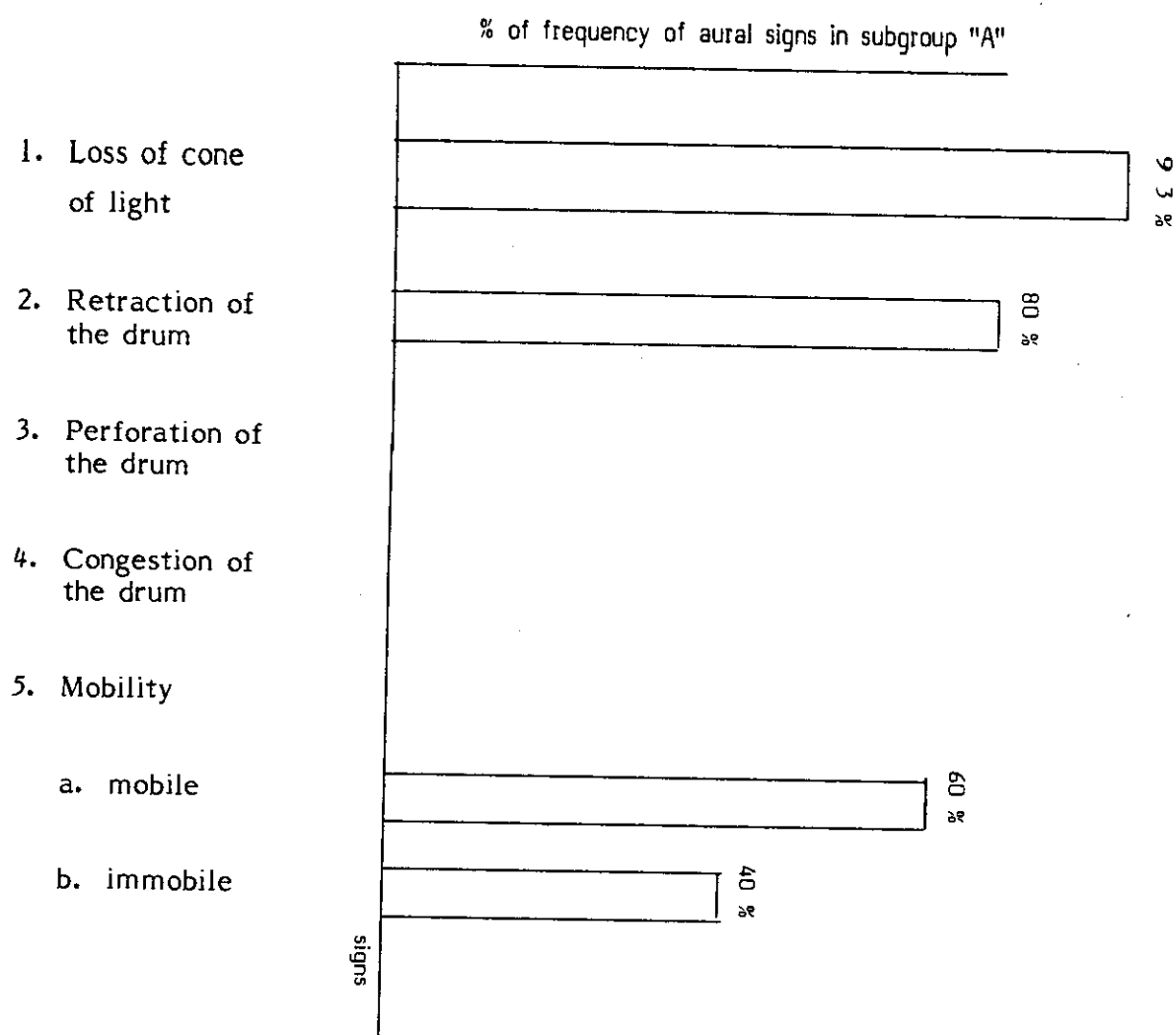Table (5) shows the main ear signs of subgroup "A"

Figure (3a)

% of frequency of aural signs in subgroup "A"

1. Loss of cone
   of light

2. Retraction of
   the drum

3. Perforation of
   the drum

4. Congestion of
   the drum

5. Mobility

   a. mobile

   b. immobile

93%

80%

60%

40%

signs

Figure (3a)is a histogram showing the percentage of frequency
of ear signs in subgroup "A"

Table (6)

Mean air conduction threshold in dB	Mean bone conduction threshold in dB	Mean air-bone gap in dB
21.25	7.5	13.75

Table (6) shows the hearing threshold of subjects of subgroup "A"

Table (7)

	Rt. ears	Lt. ears	Both
Mean max. compliance of the subject's tympanogram in ml equivalent volume	.5	.4	.45

Table (7) shows the maximum compliance of the tympanogram

in subjects of subgroup "A"

Table (8)

	Mean value of Rt. ears	Mean value of Lt. ears	Mean value of both ears
Relative external ear pressure value in mm H_2O at the maximum compliance of subgroup "A"	-33	-40	-36.5

Table (8) shows the location of the mean maximum compliance

of subjects of subgroup "A" on the tympanogram
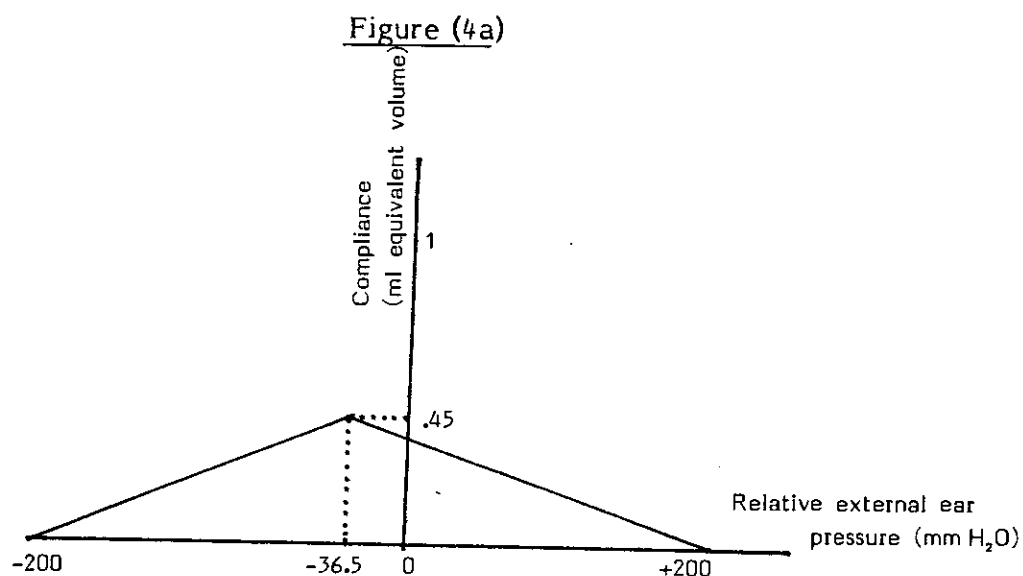
Figure (4a)

Fig.(4a) shows the mean resting tympanogram of subjects of subgroup "A"

Table (9)

Type of tympanogram	Mean Rt. ears No.	Mean Lt. ears No.	Total No.
A	11	11	22
B	3	1	4
C	1	3	4

Table (9) shows the different types of tympanograms in

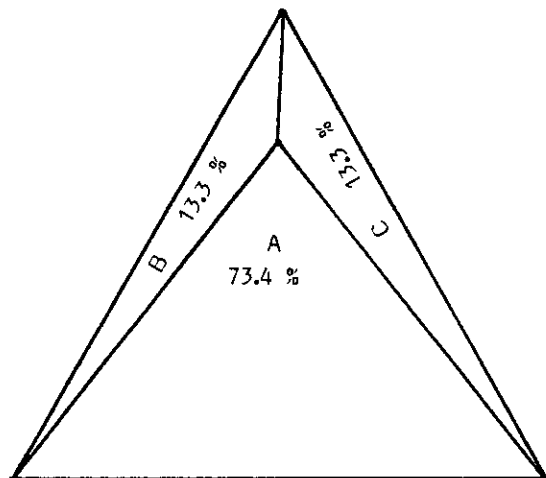subjects of subgroup "A"

Figure (5a)

Fig.(5a) shows the percentage of frequency of different

types of tympanograms in subgroup "A"

Table (10)

Maximum compliance or peak of tympanogram in subgroup "A"			
No. of middle ears at "0" mm H$_2$O		No. of middle ears at -ve pressure in mm or no max. compliance	
In resting tympanogram 22		8	
Shifting peak	non-shifting peak	shifting peak	non-shifting peak
Toynbee and Valsalva 14	8	1	7
Inflation and deflation			

Table (10) shows the results of inflation and deflation tests,

Valsalva and Toynbee on ears of subgroup "A"

Table (11)

Type of tympanogram	No. of Eustachian tube in subgroup "A"	Mean acoustic reflex threshold in dB	
B & C	8	4	NR
		4	105
A with non-shifting peak	8	NR	
A with shifting peak	14	96.4 dB	

Table (11) shows the acoustic reflex threshold in relation

to each type of Eustachian tube affection in subjects

of subgroup "A"

Table (12)

No. of Eustachian tube in study group "A"	No. of affected Eustachian tubes	Percentage of affection to the total No. of tubes
30	16	53.3 %

Table (12) shows the percentage of Eustachian tube affection

of subgroup "A"

After treatment

Treatment which was given to the patients in subgroup "A" (Acute Rhinitis and Nasopharyngitis and sinusitis) was:

1. Antibiotics: mainly Ampecillin

2. Oral antihistaminic decongestant

3. Vitamins

This treatment was given for 7 to 10 days

4. In cases of sinusitis, Mucolytic agent "Bisolvon" was added

For atrophic Rhinitis was:

- Vasodilator, e.g. Roniol.

- Vitamin A, e.g. A-Viton

- Alkaline nasal wash.

(Antibiotic was given according to infection)

Criteria of improvement of patient

<u>Clinically</u>

- Upper respiratory tract infection and aural symptoms subside.

- On examination the nasal, nasopharyngeal and aural signs disappear.

Table (13)

No. of subjects of group "A"	No. of subjects with no change on treatment	No. of subjects improved by treatment
15	2	13

Table (13) shows the effect of medical treatment on upper respiratory tract infection in subjects of subgroup "A"

N.B.

2 patients did not improve by medical treatment and needed surgical treatment.

Table (14)

Type of tympanogram	No. of Eustachian tube before treatment	No. of Eustachian tube not affected by treatment	No. of Eustachian tube changed by treatment	Type of change
B	4	4	-	-
C	4	2	2	to type A
A	22	16	6	peak become shifted

Table (14) shows the effect of treatment of upper respiratory infection on Eustachian tube function on subgroup "A"

Subgroup "B" - Velopharyngeal isufficiency group (N = 15)

The mean age was 10.5 years of which 11 subjects were children (73.3 %)

Table (1)

No. of subjects	No. of males	No. of females
15	8	7

Table (1) shows the number of males and females in subgroup "B"

Table (2)

No. of subjects	% of males	% of females
15	53.3 %	46.6 %

Table (2) shows their percentage to the total number

of subgroup "B"

Table (3)

Symptoms	No. of subjects complaining with it
1. Change of voice (Nasality)	12
2. Facial and palate deformity	9
3. Nasal obstruction	1
4. Nasal regurgitation (food and water)	6
5. Epistaxis	-
6. Crust formation	1
7. Headache	1
8. Anosmia	1
9. Rhinorrhea	-
10. Hearing loss	3
11. Tinnitus	-
12. Ear discharge	-

Table (3) shows the main symptoms of subgroup "B" and their frequency in the study subjects

Figure (1b)

% of frequency of symptoms in subjects of subgroup "B"

1. Change of voice
   (Nasality)

2. Facial & palate
   deformity

3. Nasal obstruction

4. Nasal regurgitation

5. Epistaxis

6. Crust formation

7. Headache

8. Anosmia

9. Rhinorrhea

10. Hearing loss

11. Tinnitus

12. Ear discharge

75 %

60 %
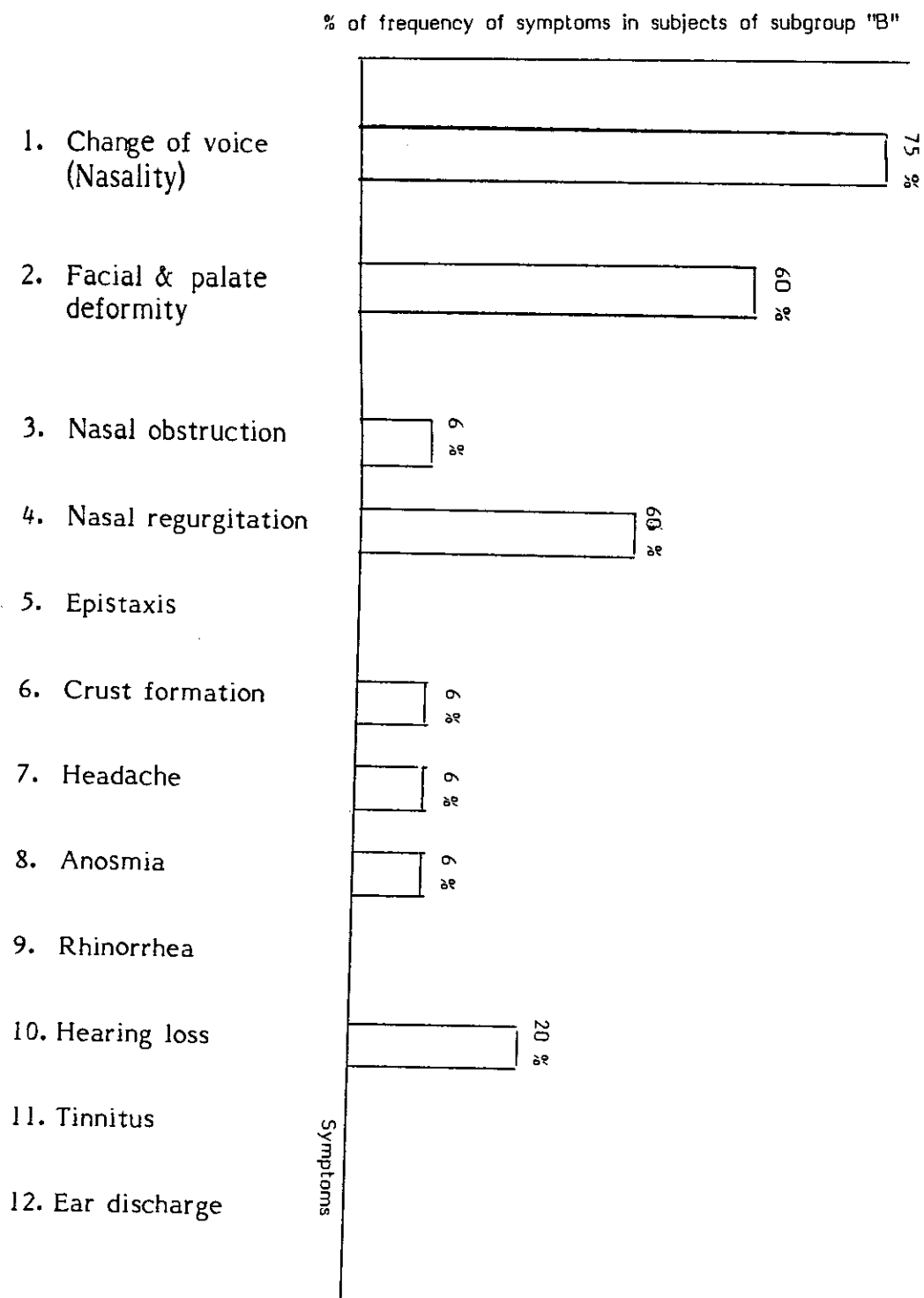
5 %

40 %

5 %

5 %

5 %

20 %

Symptoms

Fig. (1b) is a histogram showing the percentage of frequency

of symptoms in subjects of subgroup "B"

Table (4)

Main signs in group B	No. of subjects who have this sign
1. Cleft palate	
a. post. alveolar	9
b. complete	2
c. $\pm$ hare lip	2
2. Short palate	1
3. Submucous cleft palate	1
$\pm$ bifid urala	1
4. Soft palate	
a. paralysis	
b. paresis	1
c. adhesions	1
5. Pharyngeal	
a. paralysis	-
b. paresis	-
6. Loss of pharyngeal reflex	-
7. Parapharyngeal swelling	-
8. Tongue paralysis	
9. Last 4 cranial nerve affection (9, 10, 11, 12)	-

Figure (2b)

% of frequency of signs in subgroup "B"

1. Cleft palate

   a. post alveolar — 60 %

   b. complete — 13.3 %

   c. hare lip — 13.3 %

2. Short palate — 6 %

3. Submucous cleft palate — 6 %

4. Soft palate

   a. paralysis

   b. paresis — 6 %

   c. adhesions — 13.3 %

5. Pharyngeal

   a. paralysis

   b. paresis

6. Loss of pharyngeal reflex

7. Parapharyngeal swelling
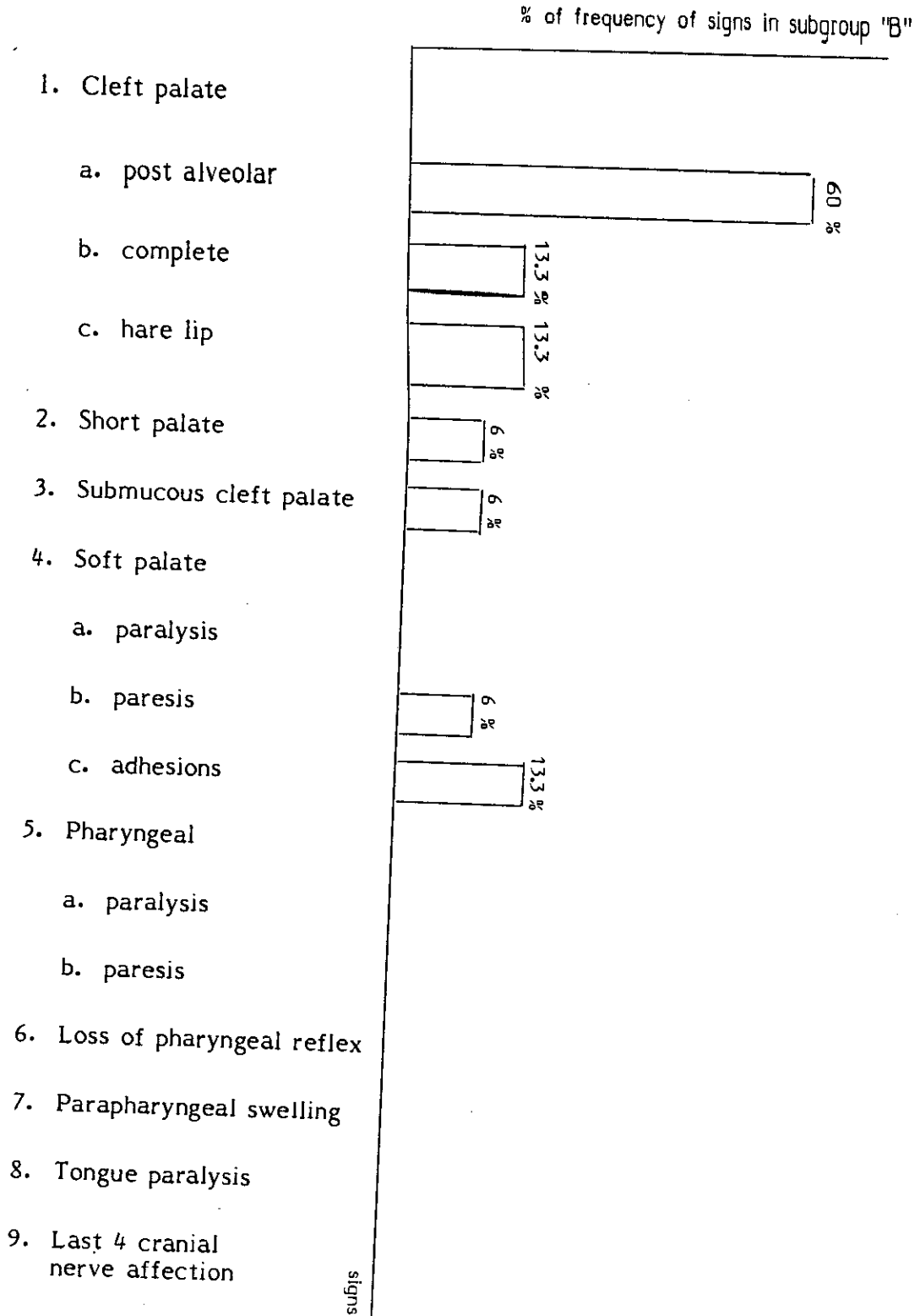
8. Tongue paralysis

9. Last 4 cranial
   nerve affection

signs

Fig. (2b) is a histogram showing the percentage of fre-

Table (5)

Ear signs	No. of subjects who have this sign
1. Loss of cone of light	14
2. Retraction of the drum	4
3. Perforation of the drum	-
4. Congestion of the drum	-
5. Mobility of the drum	
a. mobile	3
b. immobile	12

Table (5) shows the main ear signs of subgroup "B"

Figure (3b)

% of frequency of aural signs in subgroup "B"

1. Loss of cone of light

2. Retraction of the drum

3. Perforation of the drum

4. Congestion of the drum

5. Mobility of drum

    a. mobile
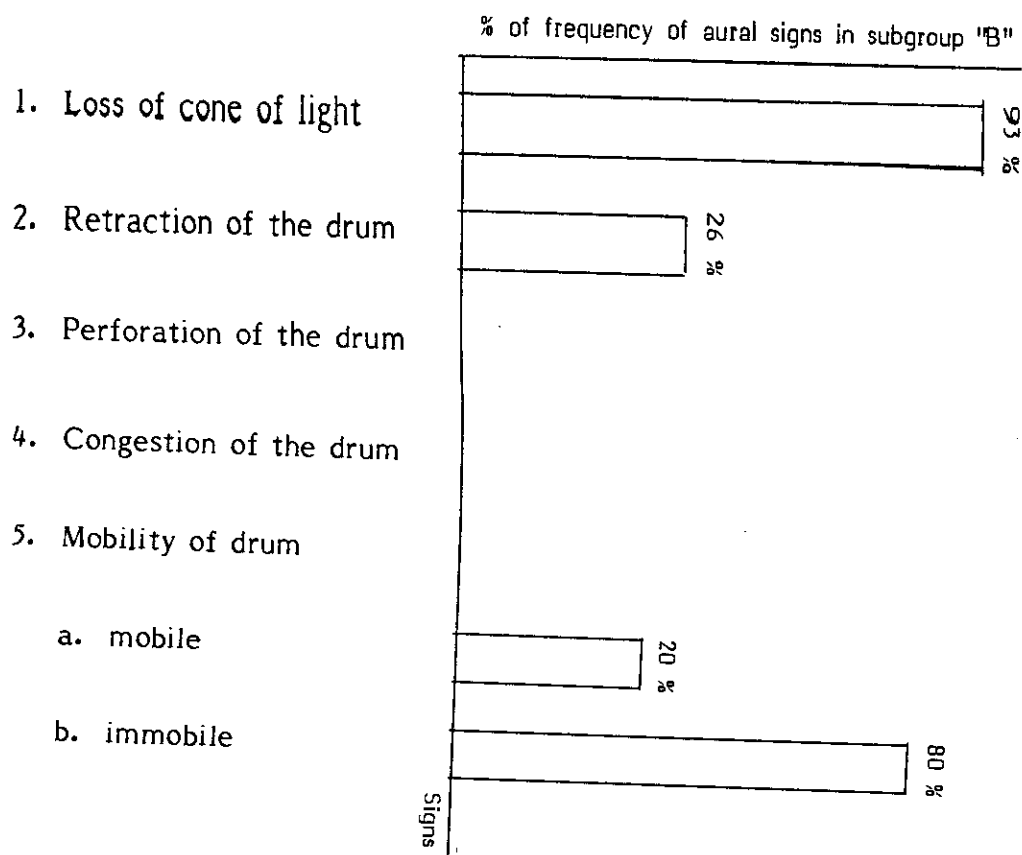
    b. immobile

93 %

26 %

20 %

80 %

Signs

Fig. (3b) is a histogram showing the percentage of frequency

of ear signs in subgroup "B"

Table (6)

No. of patients	Mean air conduction threshold in dB	Mean bone conduction threshold in dB	Mean air-bone gap in dB
15	29.2		

Table (6) shows the hearing threshold of subgroup "B"

N.B.

Most of this subgroup subjects were children so bone threshold was not tested.

Table (7)

	Rt. ears	Lt. ears	Both ears
Mean maximum compliance of subject's tympanogram in ml equivalent volume	.32	.36	.34

Table (7) shows the maximum compliance on the tympanograms

in subjects of subgroup "B"

Table (8)

	Mean value at Rt. ears	Mean value at Lt. ears	Mean value of both ears
Relative external ear pressure value in mm H_2O at the maximum compliance of subgroup "B"	-117.8	-111.5	-114.6

Table (8) shows the location of the mean maximum compliance

of subgroup "B" on the tympanogram
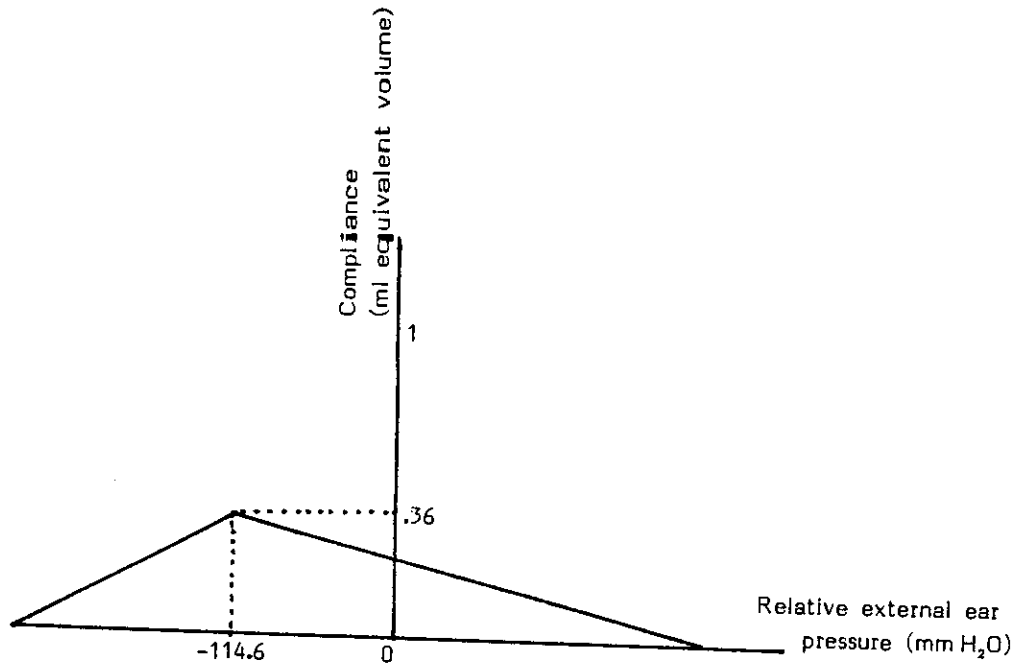
Figure (4b)

Fig.(4b) shows the mean resting tympanogram for subgroup "B"

Table (9)

Type of tympanogram	Mean Rt. ears No.	Mean Lt. ears No.	Total No.
A	4	4	8
B	7	5	12
C	4	6	10

Table (9) shows the different types of tympanogram

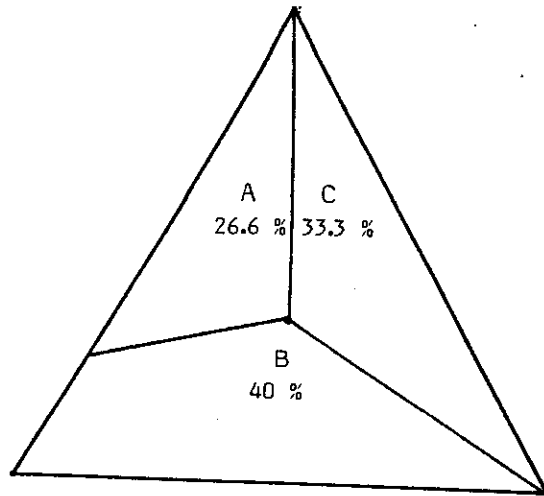- according to Jerger classification - in subgroup "B"

Figure (5b)

Figure (5b) shows the percentage of frequency of different

types of tympanograms in subgroup "B"

Table (10)

	Maximum compliance or peak of tympanograms			
	No. of middle ears at 0 pressure (mm H$_2$O)		No. of middle ears at -ve pressure (mm H$_2$O) or no max. compliance	
In resting tympanogram	8		22	
	Shifting peak	Non shifting peak	Shifting peak	Non shifting peak
- Tyonbee and Valsalva	4	4	-	22
- Inflation and deflation tests				

Table (10) shows the results of inflation and deflation test, and Toynbee and Valsalva on ears of subgroup "B"

Table (11)

Type of Tympanogram	No. of ears in subgroup "B"	Mean acoustic reflex threshold in dB
B & C	22	NR
A with non-shifting peak	4	120
A with shifting peak	4	100

Table (11) shows the acoustic reflex threshold in relation to each type of Eustachian tube affection in subjects of subgroup "B"

Table (12)

No. of Eustachian tubes in study group "B"	No. of affected Esutachian tubes	Percentage of affection to the total No.
30	26	86 %

Table (12) shows the percentage of Eustachian tube affection in subjects of subgroup "B"

After treatment

The following lines of treatment were given to group "B" subjects according to their condition:

1. Surgical repair for cases of cleft palate and submucous cleft palate. Retesting the patient was done 2 weeks after the operation.

2. Subjects of palatal paresis and short palate received speech therapy.

3. Pharyngeal and soft palate adhesions received no treatment for these conditions.

Criteria of imporovement of subjects of group "B" clinically

- Subsiding of symptoms mainly nasilty being the commonest symptom.

- Cure of some conditions such as cleft palate and submucous cleft palate after surgical repair.

Table (13)

No of patients with velopalatine insuffi-ciency	No. of subjects with no change on treatment	No. of subjects improved by treatment
15	3	12

Table (13) shows the effect of treatment of velopalatine

insufficiency on subjects of subgroup "B"

Table (14)

Type of Tympanogram	No. of Eustachian tube before treatment	No. of Eustachian tube not affected by treatment	No. of Eustachian tube changed by treatment	Type of change
B	12	6	6	2 to A 4 to C
C	10	4	6	3 to A
A	8	4	4	4 to A with shifting peak

Table (14) shows the affect of treatment of velopalatine insufficiency on Eustachian tube function on subgroup "B"

Subgroup "C" - Tumours group (N = 10)

Their mean age was 40 years old, of which one subject was a child (10 %)

Table (1)

No. of subjects	No. of males	No. of females
10	9	1

Table (1) shows the number of males and females in subgroup "C"

Table (2)

No. of subjects	% of males	% of females
10	90 %	10 %

Table (2) shows the percentage of males and females

to the total number of subgroup "C"

Tumours subjects

They were divided as follows:

i. 8 subjects had malignant tumours:

1. Undifferentiated carcinoma $T_2 \ N_2 \ M_o$

2. Metastatic carcinoma $T_1 \ N_2 \ M_o$

3. Undifferentiated carcinoma $T_2 \ N_3 \ M_o$

4. Squamous cell carcinoma $T_1 \ N_o \ M_o$

5. Undifferentiated carcinoma $T_2 \ N_1 \ M_o$

6. Undifferentiated carcinoma $T_2 \ M_o \ M_o$

7. Undifferentiated carcinoma $T_2 \ N_1 \ M_o$

8. Lympnepthelioma $T_3 \ N_o \ M_o$

ii. 2 subjects had benign tumours:

1. Non-Hodjkin's Lymphoma $\qquad$ $T_3 \ N_0 \ M_0$

2. Plasmocytoma $\qquad$ $T_3 \ N_0 \ M_0$

Table (3)

Symptoms	No. of subjects complaining with it
1. Nasal obstruction	
a. unilateral	2
b. complete	3
2. Epistaxis	4
3. Nasal discharge	1
4. Anosmia	3
5. Headache	4
6. Sore throaght	4
7. Neck masses	4
8. Cranial nerve affection	-
9. Hearing loss	6
10. Tinnitus	3
11. Ear discharge	2

Table (3) shows the main symptoms of subgroup "C"

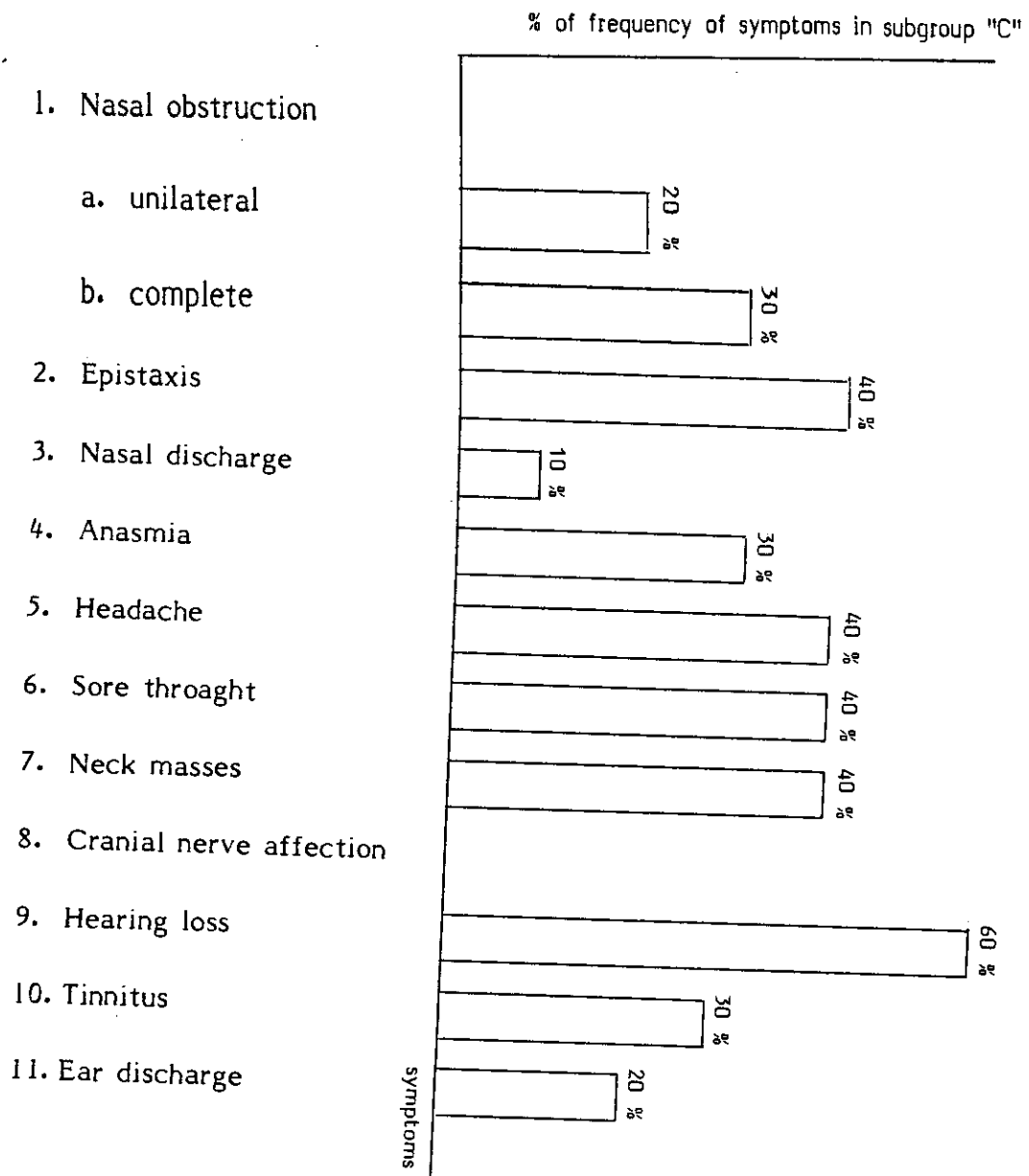and their frequency in the study subjects

Figure (1c)

% of frequency of symptoms in subgroup "C"

1. Nasal obstruction

    a. unilateral

    b. complete

2. Epistaxis

3. Nasal discharge

4. Anasmia

5. Headache

6. Sore throaght

7. Neck masses

8. Cranial nerve affection

9. Hearing loss

10. Tinnitus

11. Ear discharge

Fig. (1c) is a histogram showing the percentage of frequency of symptoms in subjects of subgroup "C"

Table (4)

Main signs in subgroup C	No of subjects who have this sign
1. Nasopharyngeal lesions	
a. Friable mass with hard base and ulcerated surface and bleeds easily on touch	4
b. malignant ulcer	2
c. regular mass with smoothsurface	2
2. Oropharyngeal lesion	
a. malignant mass	1
b. malignant ulcer	1
3. Soft palate masses (Malignant)	1
4. Nasal masses (Malignant)	1
5. Nasal discharge	2
6. Nack swellings (Malignant lymph node which is hard, infiltrating to the surrounding)	
a. unilateral	2
b. bilateral	2
7. Swelling in the face	1

Table (4) shows the signs in subgroup C and their frequency

in subjects of this subgroup

Figure (2c)

% of frequency of signs in subgroup "C"

1. Nasopharyngeal malignant mass — 40 %

2. Nasopharyngeal malignant ulcer — 20 %

3. Nasopharyngeal benign mass — 20 %

4. Oropharyngeal malignant mass — 10 %

5. Oropharyngeal malignant ulcer — 10 %

6. Soft palate malignant mass — 10 %

7. Nasal malignant mass — 10 %

8. Nasal discharge — 20 %

9. Malignant cervical lymph nodes

   a. unilateral — 20 %

   b. bilateral — 20 %

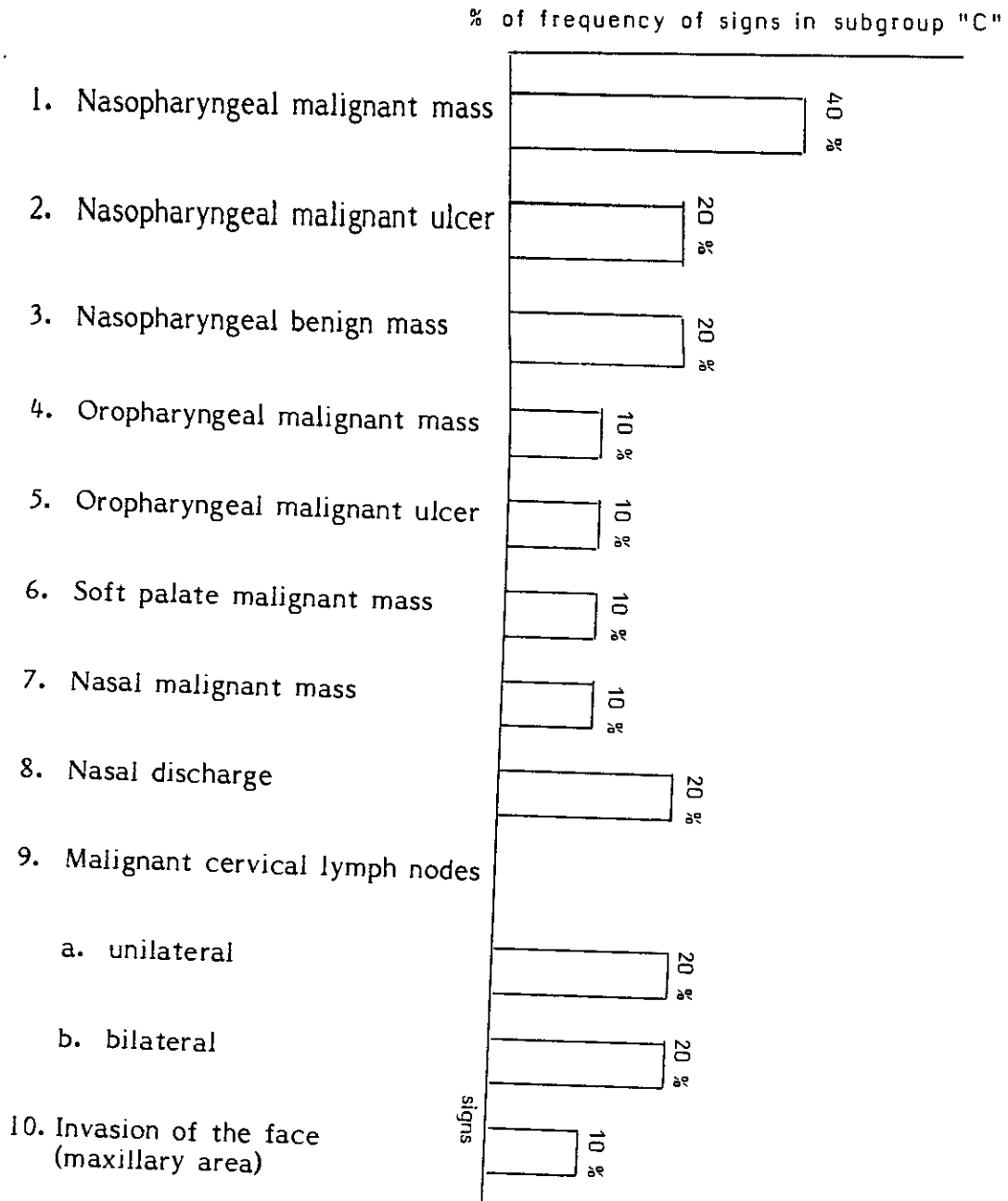10. Invasion of the face (maxillary area) — 10 %

signs

Fig. (2c) is a histogram showing the percentage of frequency of signs in study subjects of subgroup C

Table (5)

Ear signs	No. of subjects who have this sign
1. Loss of cone of light	4
2. Retraction of the drum	12
3. Perforation of the drum	2
4. Congestion of the drum	2
5. Mobility of the drum	
a. mobile	10
b. immobile	10

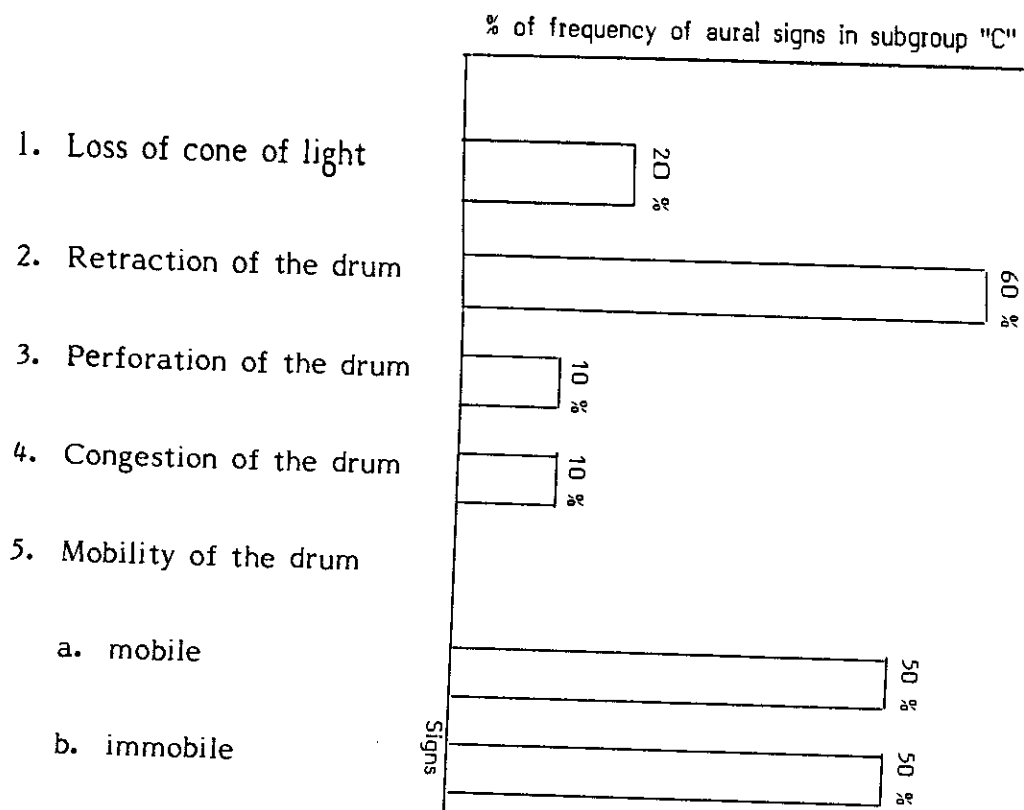Table (5) shows the main ear signs of subgroup "C"

Figure (3c)

% of frequency of aural signs in subgroup "C"

1. Loss of cone of light

2. Retraction of the drum

3. Perforation of the drum

4. Congestion of the drum

5. Mobility of the drum

   a. mobile

   b. immobile

Fig. (3c) is a histogram showing the percentage of frequency of ear signs in subgroup "C"

Table (6)

Type of tumour	No. of subjects	Mean air conduction threshold in dB	Mean bone conduction threshold in dB	Mean air bone gap in dB
Malignant	8	54.3	24.3	30
Benign	2	32.5	15	17.5

Table (6) shows the hearing threshold of subgroup "C"

before treatment

Table (7)

	Rt. ears	Lt. ears	Both ears
Mean max. compliance of subject's tympanogram in ml equivalent volume	.22	.31	.26

Table (7) shows the maximum compliance of tympanograms

in subjects of subgroup "C"

Table (8)

	Mean value of Rt. ears	Mean value of Lt. ears	Mean value of both ears
Relative external ear pressure value in mm H_2O at the maximum compliance of group "C"	-177	-169.5	-173.2

Table (8) shows the location of the mean maximum compliance
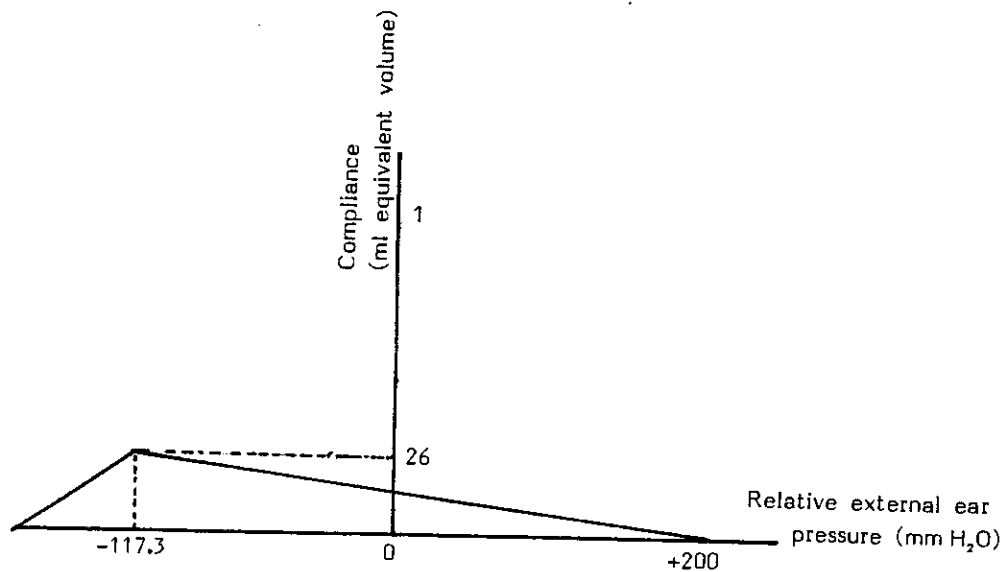
of subgroup "C" subjects on the tympanogram

Figure (4c)

Fig. (4c) shows the mean resting tympanogram of subject

of subgroup "C"

Table (9)

Type of Typmanogram	Mean Rt. ears No.	Mean Lt. ears No.	Total No.
A	4	1	5
B	3	3	6
C	4	3	7

Table (9) shows the different types of tympanogram according

to Jerger's   classification in subgroup "C"

N.B.

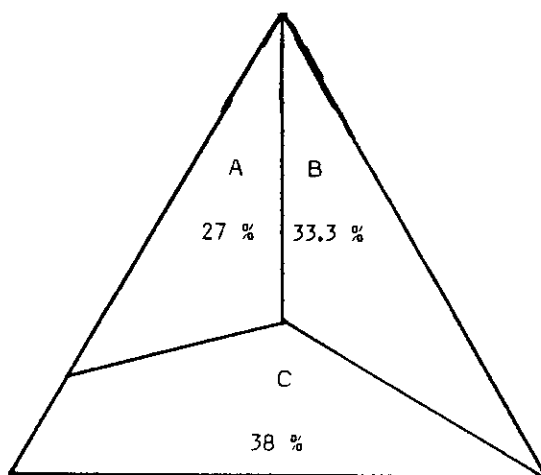2 ears were perforated not included in the results

Figure (5c)

Fig. (5c) shows the percentage of frequency of different

types of tympanograms in subgroup "C"

Table (10)

Maximum compliance or peak of tympanogram in subgroup "C"			
No. of middle ears at 0 pressure (mm H_2O)		No. at -ve pressure in mm (H_2O) or no max. compliance	

In resting tympanogram

	No. of middle ears at 0 pressure (mm H_2O)		No. at -ve pressure	
	5		13	
	Shifting peak	Non-shifting peak	Shifting peak	Non-shifting peak
- Toynbee and Valsalva	2	3	3	10
- Inflation and deflation				

Table (10) shows the results of inflation and deflation tests, Valsalva and Toynbee on ears of subgroup "C"

Table (11)

Type of Tympanogram	No. of Eustachian tube in subgroup C	Mean acoustic reflex threshold in dB
B & C	13	NR
A with non-shifting peak	3	110
A with shifting peak	2	90

Table (11) shows the acoustic reflex threshold in relation
to each type of Eustachian tube affection in subjects
of subgroup "C"

Table (12)

No. of Eustachian tube in study group C	No. of affected Eustachian tubes	Percentage of affection to threshold No.
20	16	88 %

Table (12) shows the percentage of Eustachian tube affection of subgroup "C"

After treatment

Treatment given to subjects of subgroup "C" can be outlined as follows:

For malignant nasopharyngeal tumours:

Radiotherapy in a dose of 6000 to 8000 rad divided on daily setting, each setting the subject was given 200 - 300 rads.

For benign tumours:

The tumours were removed surgically using transpalatal approach.

The re-evalution of subjects was done 10 to 15 days after the end of treatment except for 2 subjects with malignant tumours who were re-examined after 3 - 4 months from the end of treatment.

Criteria of improvement of group "C"

1. Regression of nasal and aural symptoms and signs
2. Regression of lymph nodes of the neck if present.

Table (13)

No. of subjects	No. of subjects with no change on treatment	No. of subjects improved by treatment
with malignant tumours (8)	3	5
with benign tumours (2)	-	2

Table (13) shows the effect of treatment on subgroup "C"

subjects

N.B.

Although the tumour had responded to radiotherapy yet still these patients with no change on treatment are complaining from nasal, aural symptoms or neck masses.

Table (14)

Type of Tympanogram	No. of Eustachian tube before treatment	No. of Eustachian tube not affected by treatment	No. of Eustachian tube changed by treatment	Type of change
B	6	4	2	to type C
C	7	5	2	to type A
A	5	2	3	1 to type C 2 to type A with shifting peak

Table (14) shows the effect of treatment of nasopharyngeal

tumour on Eustachian tube function on subgroup "C"

Control group (N = 40)

The mean age was 20.7 years of which 15 subjects were children (37.5 %)

Table (1)

No. of subjects	No. of males	No. of females
40	22	18

Table (1) shows the number of females and males in control group

Table (2)

No. of subjects	% of males	% of females
40	55 %	45 %

Table (2) shows the percentage of males and females to
the total number of control group

Table (3)

Mean air conduction threshold in dB	Mean bone conduction threshold in dB	Mean air bone gap in dB
15 dB	15.75 dB	-

Table (3) shows the hearing threshold for the control group

Table (4)

	Rt. ears	Lt. ears	Both ears
Mean max. compliance of subject's tympano- gram in ml equivalent volume	.9	.9	.9

Table (4) shows the maximum compliance of the tympanograms

in subjects of control group

Table (5)

	Mean value at Rt. ears	Mean value at Lt. ears	Mean value of both ears
Relative external ear pressure value in mm H₂O at the maximum compliance of control group	-37.4	-50	-43.75

Table (5) shows the location of the mean maximum compliance

of control group on the tympanogram
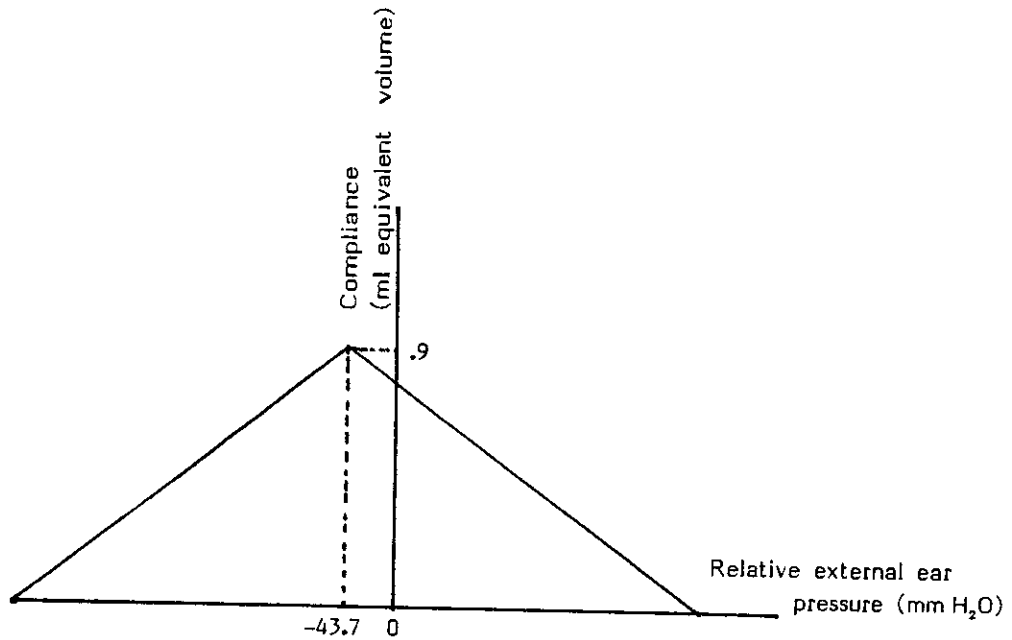
Figure (a)

Fig. (a) shows the mean resting tympanogram for control group

Table (6)

Type of Tympanogram	Mean Rt. ears No.	Mean Lt. ears No.	Total No.
A	40	40	80
B	-	-	-
C	-	-	-

Table (6) shows the different types of tympanogram in control group according to Jerger classification
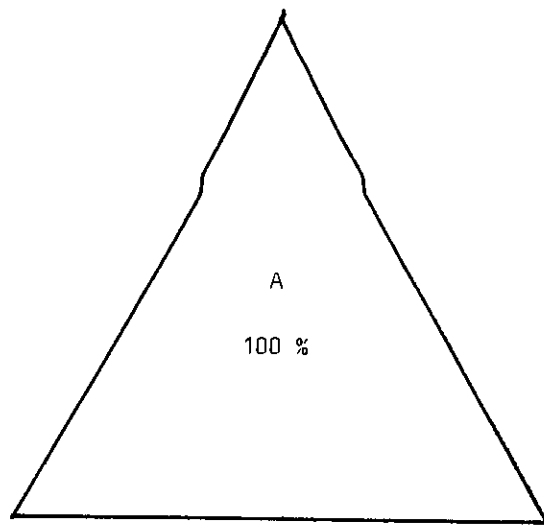
Figure (b)

A

100 %

Fig. (b) shows the percentage of frequency of tympanograms

in control group

Table (7)

Maximum compliance or peak of tympanograms in control group	
No. at "0" pressure (mm H_2O)	
In resting tympanogram	80

	Shifting peak	Non-shifting peak
Inflation and deflation tests	53	27

Table (7) shows the results of inflation and deflation tests

in control group

Table (8)

No of Eustachian tube in control group	Mean acoustic reflex threshold in dB
80	95 dB

Table (8) shows the mean acoustic reflex threshold in dB

in the control group