RESULTS

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Group I : Group of nitrous oxide anaesthesia (Table 1 and Fig. 1)

- For all cases audiogram was obtained in the night before the operation , it was of normal shape in all cases for both ears.
- In the night of the day after the operation: other audiogram is performed , it showed a significant hearing loss for all cases , but its amount varied with different frequencies :

1 - At the frequency of 250 HZ , the hearing loss ranged from 10 to 25 d.B, with a mean of 12.5 d.B.

2- At the frequency of 500 HZ. the hearing loss ranged between 5 to 25 d.B with a mean of 13 d.B.

3- At the frequency of 1000 HZ , the hearing loss ranged between 10 and 20 d.B, with a mean of 14 d.B.

4- At the frequency of 2000 HZ the hearing loss was about 5 to 10 d.B, with a mean of 7 d.B.

5- At the frequency of 4000 HZ the loss ranged between 0 to 5 d.B, with a mean of 4 d.B.

- After the operation by 72 hours , third audiogram was obtained , it showed that the hearing acuity is improved , and that the hearing loss is still present but becomes non - significant :

1- At 250 HZ , the loss ranged from 5 to 10 d.B, with a mean of 4 d.B.

2- At 500 HZ , the loss was about 5 to 10 d.B with a mean

of 3.5 d.B.

3- At 1000 HZ , the loss was about 5 to 15 d.B with a a mean of 5 d.B.

4 - At 2000 HZ, the loss was about oto 10 10 d.B with a mean of 2.5 d.B.

5 - At the frequency of 4000 d.B, the loss ranged between 0 to 5 d.B with a mean of 2 d.B.

- From these results, it is noticed that some degree of hearing loss occur after nitrous oxide anaesthesia, and this loss is higher at the low frequencies. It is noticed also that it is spontaneously improved by the third post operative day.

Group II :Spinal intradural anaesthesia group :

(Table 2 and graph 2)

- The age of the cases of this group ranged between 14 to 51 years with a mean of 35.5 years.

- Audiogram was obtained for all cases in the night before operation , it was of normal shape in both ears for all cases.

- At the night of the day after the operation , a second audiogram was obtained which showed significant hearing loss-P < 0.05- in 23 cases (76 %) and no change in the other cases (24%).

The hearing loss in those 23 cases was as follows :

1- At the frequency of 250 HZ , the hearing loss ranged from 15 to 40 d.B with a mean of 26 d.B.

2- At the frequency of 500 HZ , the hearing loss , ranged from 15 to 35 d.B with a mean of 25 d.B.

3- At the frequency of 1000 HZ , the hearing loss ranged from 10 to 25 d.B with a mean of 19 d.B.

4- At the frequency of 2000 HZ , the hearing loss ranged from 5 to 15 d.B with a mean of 9 d.B.

5- At the frequency of 4000 HZ , the hearing loss ranged from 0 to 5 d.B, with a mean of 3 d.B.

- After the operation by 72 hours , a third audiogram performed, it showed improvement in hearing and the hearing loss became non significant - ($P > 0.05$) :-

1- At the frequency of 250 HZ , the hearing loss ranged from 5 to 15 d.B, with a mean of 9.5 d.B.

2- At the frequency of 500 HZ the hearing loss ranged from 5 to 15 d.B with a mean of 11 d.B.

3- At the frequency of 1000 , the hearing loss ranged from 5 to 10 d.B with a mean of 8.5 d.B .

4- At the frequency of 2000 HZ. the hearing loss ranged between 0 and 5 d.B with a mean of 3.5 d.B.

5- At the frequency of 4000 HZ , the hearing loss was between 0 and 5 d.B with a mean of 2.d.B.

- These results inform us that there is a hearing loss after spinal intradural anaesthesia affecting all frequencies , but it is higher at the low frequencies . It is also noticed that hearing loss is spontaneously improved by the third post - operative day .

Group III : Group of spinal epidural anaesthesia : (Table

3 and Fig. 3)

- Audiogram was performed for all cases in the night before operation , it was of normal shape in both ears for all cases.
- In the night of the day following the operation , a second audiogram was performed , it showed a significant hearing loss -P < 0.05- in 22 cases (73 %) - as statistically determined -. and no changein 8 cases (27 %) :

1- At 250 HZ , the loss ranged between 20 and 40 d.B. with a mean of 22 d.B.

2- At 500 HZ , the loss ranged from 15 to 35 d.B with a mean of 19 d.B.

3- At 1000 HZ , the loss ranged from 15 to 30 d.B with a mean of 18.5 d.B.

4- At the frequency of 2000 H.Z, the loss ranged between 10 and d.B with a mean of 12 d.B.

5- At 4000 HZ , the loss was about 0 to 10 d.B with a mean of 6 d.B.

- In the third postoperative day - i.e. 72 hours after the operation - , a third audiogram was performed for all cases , it showed improvement of the hearing to the level at which the loss became non significant -P > 0.05- for all cases at all frequencies:

1- At 250 HZ , the loss was between 5 and 10 d.B with a mean of 7.5 d.B.

2- At 500 HZ , the loss was between 5 and 10 d.B with a mean of 8 d.B.

3- At 1000 HZ . the loss ranged from 0 and 10 d.B with a mean of 6.5 d.B.

4- At the frequency of 2000 HZ . the loss was between 0 and 5 d.B with a mean of 4 d.B.

5- At 4000 HZ . the loss ranged between 0 and 5 d.B with a mean of 2.5 d.B .

These results inform us that spinal epidural anaesthesia produces hearing loss in the majority of cases . it is more marked at low frequencies . and it is improved spontaneously by the third postoperative day .

Group IV : Group of anaesthesia by Ether : (Table 4 and Fig.4)

- Audiogram was performed for all cases in the night before operation . it was of normal shape for all cases in both ears.
- A second audiogram was obtained at the night of the day following the opertion . it showed no hearing loss for all frequencies at both ears .
- A third audiogram was obtained in the third postoperative day night . it showed . also . no change in the audiotory acuity .
- These results reveal that anaesthesia by ether has no effect on the hearing .

Table (1) : Effect of general anaesthesia by Nitrous oxide on auditory acuity .

	250			500			1000			2000			4000		
Time of audiometry	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D
1-Before the operation	30	31.2	3	30	32.5	3.1	30	31.5	3.2	30	30	3	30	28.5	2.9
2-After the operation by 24 hours .	30	40.5	3	30	45	3.1	30	40.5	3	30	37	3	30	32	3
3-After the operation by 72 hours .	30	34	3	30	33.5	3	30	37.5	3.1	30	32.5	3.1	30	29	2.9
P.After the operation by 24 hours .	< 0.05			< 0.05			< 0.05			< 0.05			< 0.05		
P after the operation by 72 hours .	> 0.05			> 0.05			> 0.05			> 0.05			> 0.05		

P < 0.05 means that it is a significant result.

P > 0.05 means that it is nonsignificant tesult.

Table (2) : Effect of spinal intradural anaesthesia on auditory acuity .

Time of audiometry	250			500			1000			2000			4000		
	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D
1-Before the operation	30	17.5	3	30	21	3	30	19	3	30	17	3.3	30	18	3.2
2-After the operation by 24 hours .	30	33.5	3.1	30	38	3	30	29	3.2	30	29	3.2	30	23.5	3.3
3-After the operation by 72 hours .	30	19	3	30	28	3	30	20.5	3	30	19	3.3	30	19	3.3
P.after the operation by 24 hours .	< 0.05			< 0.05			< 0.05			< 0.05			< 0.05		
P.after the operation by 72 hours .	> 0.05			> 0.05			> 0.05			> 0.05			> 0.05		

P $<$ 0.05 means that it is a significant result.

P $>$ 0.05 means that it is nonsignificant result.

Table (3) : Effect of epidural anaesthesia on auditory acuity .

Time of the audiometry	250			500			1000			2000			4000		
	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D
1-Before the operation	30	17.5	3.3	30	20	3.1	30	17	2.9	30	18	3	30	18	3.2
2-After the operation by 24 hours .	30	34	3.1	30	28.5	3.1	30	29	3	30	31	2.9	30	23.5	3
3-After the operation 72 hours .	30	25.5	3	30	23	3	30	24	2.9	30	22.5	3	30	18.5	3.1
P.after the operation by 24 hours .	< 0.05			< 0.05			< 0.05			< 0.05			< 0.05		
P.after the operation by 72 hours .	> 0.05			> 0.05			> 0.05			> 0.05			> 0.05		

P $<$ 0.05 means that it is a significant result .

P $>$ 0.05 means that it is nonsignificant result .

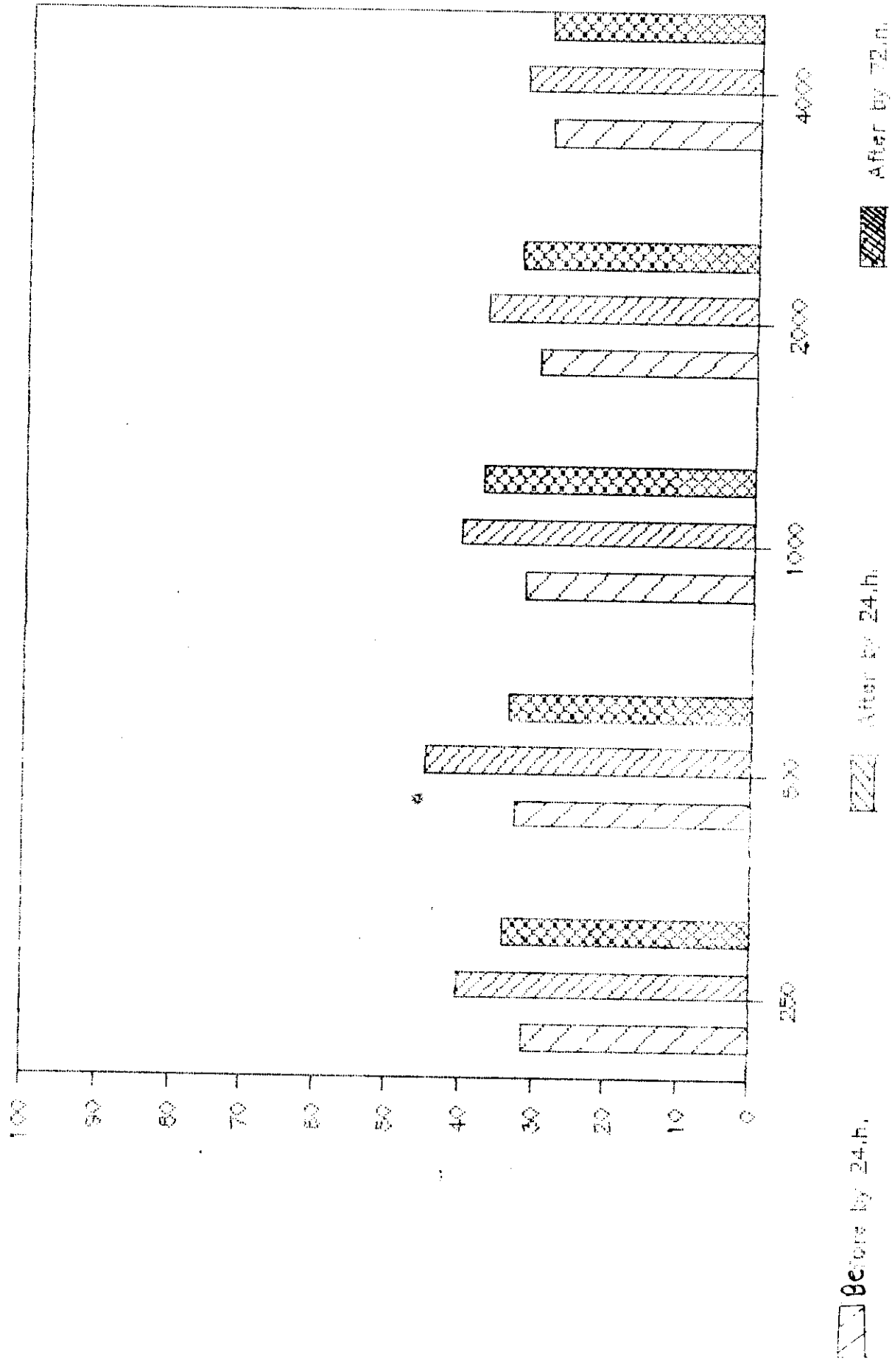
Table (4) : Effect of general anaesthesia by ether on auditory acuity .

Time of audiometry	250			500			1000			2000			4000		
	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D	No.	$\bar{X}$	S.D
1-Before the operation	30	29	4.1	30	30	4.5	30	29	4.2	30	29	3.9	30	28.5	3.8
2-After the operation by 24 hours .	30	27.5	4.1	30	30.5	4.4	30	29	4.2	30	29.5	4	30	28.5	3.9
3-After the operation by 72 hours .	30	26.5	4	30	30.5	4.2	30	29.5	4.3	30	29	3.9	30	29	3.7
P.after the operation by 24 hours .	> 0.05			> 0.05			> 0.05			> 0.05			> 0.05		
P.after the operation by 72 hours .	< 0.05			< 0.05			< 0.05			< 0.05			< 0.05		

P $<$ 0.05 means that it is significatn results.

P $>$ 0.05 means that it is nonsignificant results.

Fig. (1)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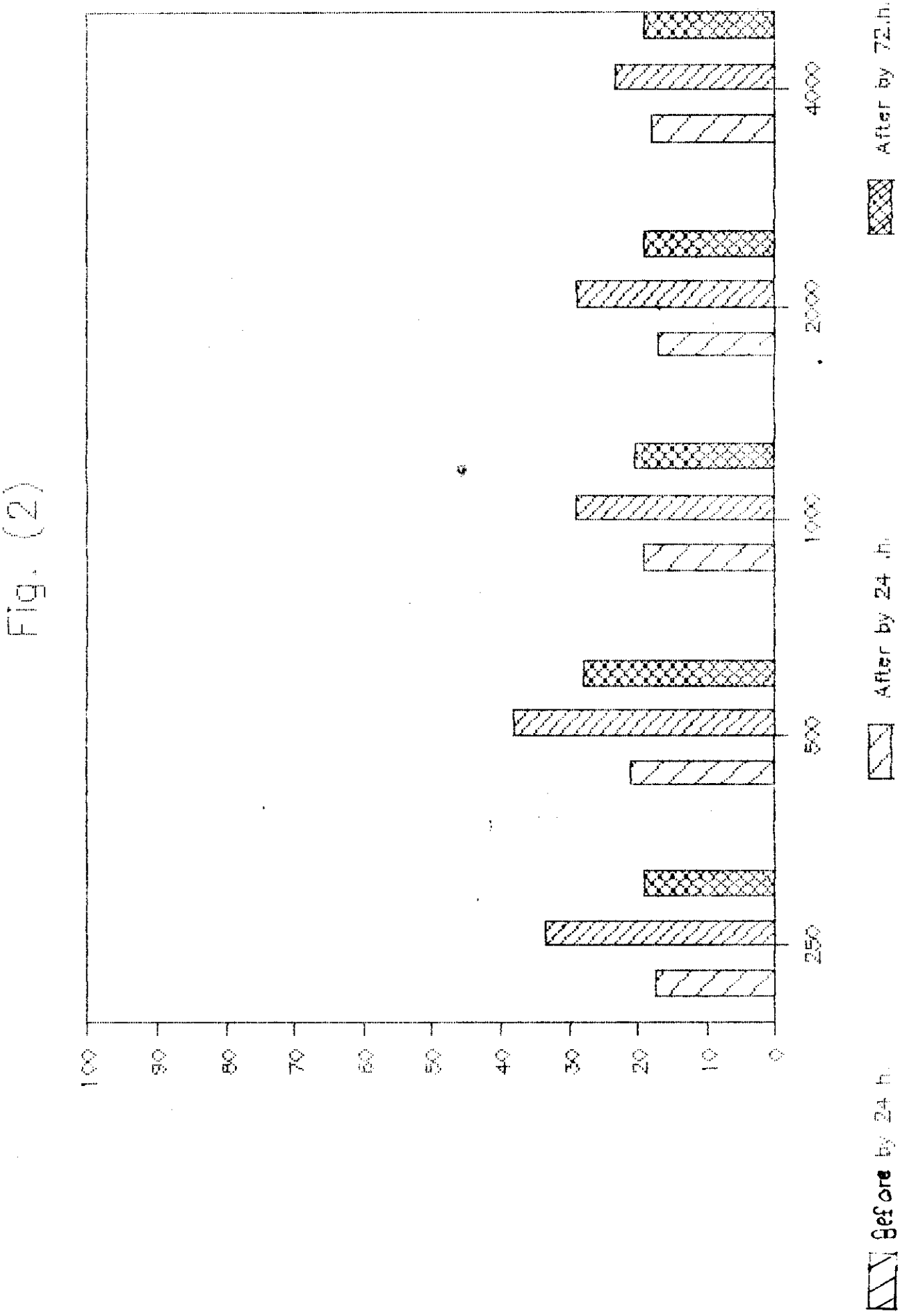
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Fig. (2)

Fig. (3)

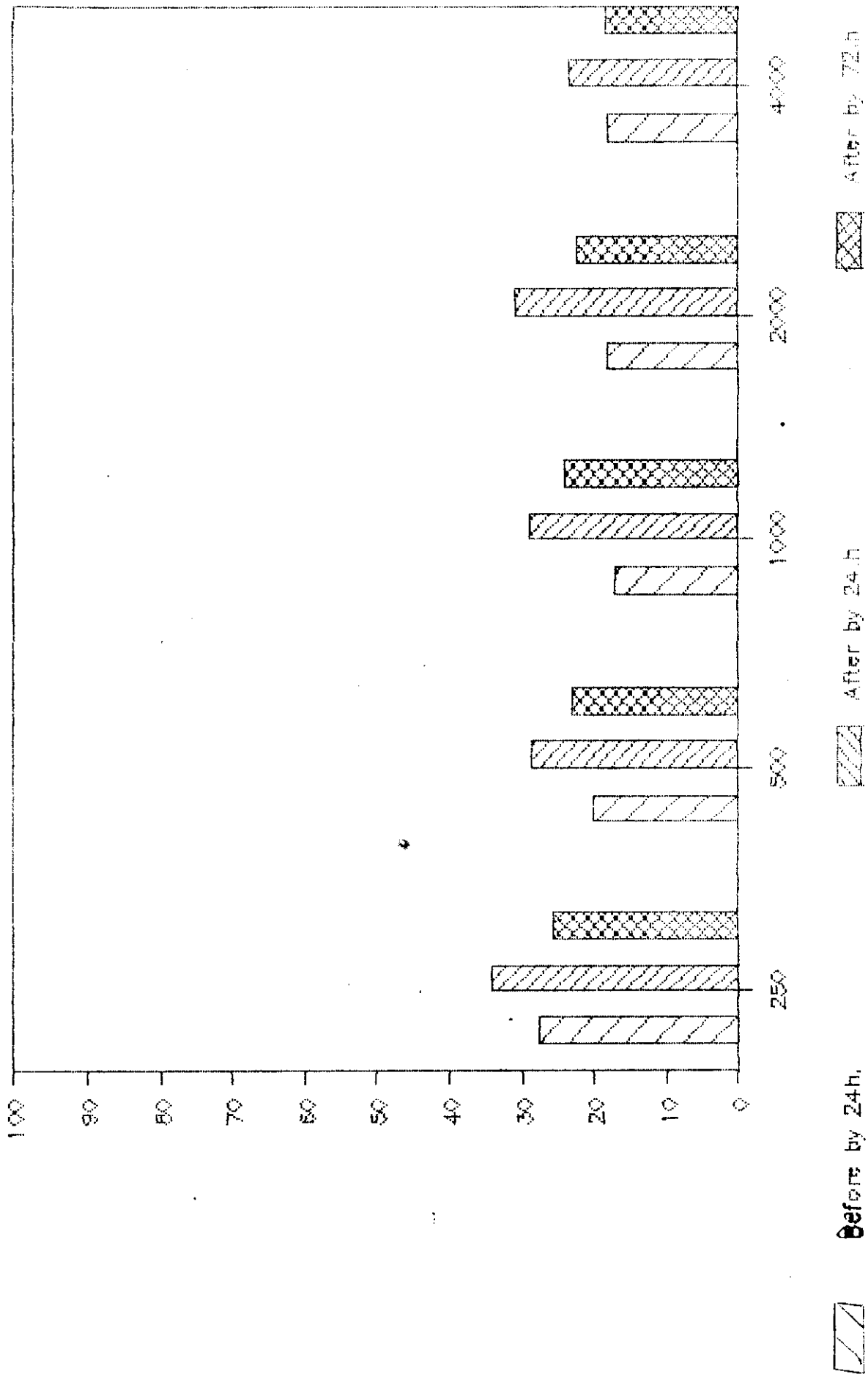
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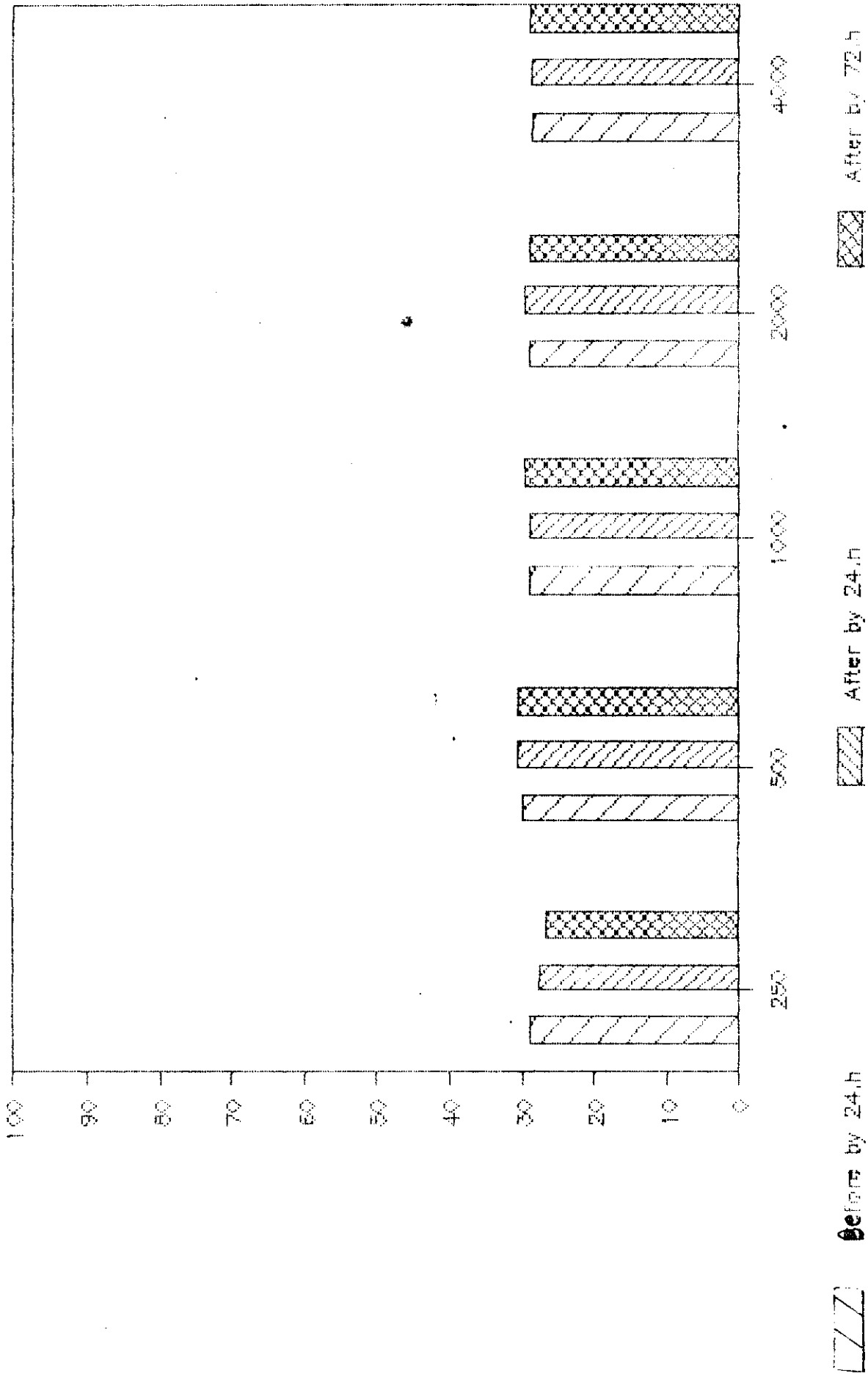
Fig. (4)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