

Ultrasonics in the Treatment of Arthrosis

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INTRODUCTION

The therapeutic effects of ultrasonic waves in the treatment of arthrosis have previously been pointed out by L. Tivivelli (1) while W. Zinn and V. Sonnenschein have indicated the results of ultrasound therapy in rheumatic and degenerative joint diseases (2).

In the year 1949, Professor Mather Rech (3) verified the effects of ultrasound on 1162 cases of arthrosis and over a period of 5 years 4253, cases of various pathologies were treated with ultrasound by John Aldes (4).

H. J. Behrend firmly believed that ultrasonic treatment had shown painrelieving effects in the case of arthrosis (5). Lehmann also described the same effects in the case of degenerative joint disease. (7-8)

The successful therapeutic effects of ultrasound in the treatment of degenerative joint diseases have similarly been confirmed in our previous report on 1965 (6).

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In view of the beneficial effects of ultrasound in the relief of pain and spasm, (5-6-7) and in the basis of the above experimental and therapeutical results obtained by many researchers, (3-6-7) we have continued using ultrasound as a method of treatment in the case of arthrosis.

The present report describes the result obtained from ultrasound treatment of arthrosis within a period from December 1971 to April 1974.

MATERIALS AND METHODS:

Ultrasound is emitted from a round 4cm diameter sound head at a frequency of 870000 cycles per second. We have been using an ultrasound with a maximum outputs of 12 watts. The nature of ultrasound waves does not allow them to pass through the airspace and a coupling agent such as water or paraffin is therefore necessary to transmit the waves. An average number of 20 sonations has been effected in complete treatment, each sonation taking from 10 to 15 minutes.

A total number of 96 patients (table I) were treated during the period under consideration, all of whom had, prior to the use of ultrasonic waves, been treated with corticosteroids, aspirin, salicilate derivatives, Phenyyl-butazone, indomethacin, vitamines B1 B12, intra-articular injections of corticosteroid for many years in certain cases.

The patients under experiment, selected from amongst 144 patients referred to the Medical Physics Department of Medical school of Tehran-University. They were all suffering from pain and in certain cases from limitation of movement in different articulation. Those who were suffering from rheumatoid arthritis, gout, acute rheumatism, arteritis and postfracture coditions were excluded from our asmping and remaining 92 patients suffering from degenerative joint diseases and 4 cases of knee orthrosis, were selected for trial.

No.	Name of Patient	Genre	Age	Involved area	Number of sessions	Recovery Percent
1	Gh-M.	F.	54	L3-L4	12	80%
2	W-D.	F.	58	C5-C6	12	100%
3	Ak-Sh-R.	F.	34	C3-C4	9	60%
4	S-M	F.	40	L4-L5	12	70%
5	N-M.	M.	47	C5-C6	12	80%
6	N-D.	F.	55	C4-C5	17	90%
7	Dr. D.	M.	72	L3-L4	10	50%
8	S.M.Kh	M.	45	C5-C6	10	100%
9	E. P.	M.	57	C5-C6	15	50%
10	Sh.R	M.	25	L1-L2	12	100%
11	AS.R.	F.	48	C5-C6	12	0%
12	A.S.	M.	45	L4-L5	12	80%
13	L.S.	F.	42	C2-C3	12	60%
14	Dr. N.M.	M.	42	L2-L3	15	100%
15	I.R.	F.	47	L3-L4	15	80%
16	M.A.N.	M.	77	L3-L4	15	80%
17	S.S	F.	44	C5-C6	4	?
18	A.M.P.	F.	43	L3-L4	20	100%
19	Dr. Sh.	F.	60	L5-S	12	50%
20	Dr. M.Z	M.	43	C5-C6	15	100%
21	N.MV.	F.	50	L4-L5	3	0%
22	H.A.	M.	44	C5-C6	12	100%
23	E.E.	F.	45	C5-C6	9	80%
24	S.E.	M.	50	L3-L4	12	100%
25	T.E.D.	F.	50	Si-L5	16	100%
26	E.V.N.	M.	44	Si-L5	12	100%
27	H.B.	M.	40	L4-L5	20	100%
28	I.Z.	M.	32	L2-L3	15	0%
29	N.M.	F.	45	L3-L4	10	50%
30	N.M.	F.	47	C5-C6	20	100%
31	F.R.	F.	40	L3-L4	15	40%
32	A.E.Z.	M.	47	C5-C6	15	50%

No.	Name of Patient	Genre	Age	Involved area	Number of Sessions	Recovery Patient
33	T.Kh.	F.		C2-C3	12	30%
34	B.Kh.	M.	46	L3-L4	10	50%
35	S.T.Gh.	M.	50	C5-C6	12	50%
36	A.E.	M.	62	L4-L5	10	100%
37	M.Z.	F.	45	L2-L3	10	50%
38	B.R.	F.	32	C2-C3	20	0%
39	P.A.	F.	40	C5-C6	15	0%
40	Sh.N.	F.	42	L5-Si	20	50%
41	H.P.A.	M.	55	C5-C6	18	70%
42	S.A.	M.	39	L3-L4	2	?
43	Kh.A.	F.	60	L4-L5	20	100%
44	M.E.	M.	48	C2-C3	15	100%
45	F.Dj.	F.	64	Knee	20	80%
46	M.Gh.	F.	70	L2-L3	20	80%
47	F.S.	M.	46	L2-L5	10	100%
48	R.S.	M.	52		4	??%
49	H.M.	F.	40	L3-L4	12	60%
50	R.	F.	38	L4-L5	15	100%
51	P.K.	F.	34	C5-C6	12	100%
52	G.H.	F.	52	L2-L3	20	100%
53	M.K.	F.	54	C5-C6	20	50%
54	K.	F.	50	C5-C6	12	50%
55	E.	F.	38	C6-C7	20	??%
56	N.	F.	42		6	100%
57	H.	F.	30	C5-C6	10	50%
58	Dr.B.	M.	55		22	100%
59	A..	M.	60	L5-Si	10	100%
60		F.	45	C5-C6	20	80%
61	A.M.	F.	52	L4-L5	10	80%
62	Dj.B.S.	M.	50	L3-L4	12	??%
62	M.Gh.	F.	45	C6-C7	10	50%
64	E.H.	M.	55	C5-C6	4	50%

No.	Name of Patient	Genre	Age	Involved area	Number of Sessions	Recovery Percent
65	N.D.	F.	32	C5-C6	10	50%
66	A.M.F.	M.	37	D8-D9	12	60%
67	P.Z.	M.	60	L4-L5	10	50%
68	A	F.	42	C5-C6	20	100%
69	M.A.	M.	67	C2-C3	20	100%
70	I.D.	F.	50	C5-C9	20	100%
71	M.S.	F.	60	C5-C9	17	100%
72	R.T.	F.	47	C5-C9	20	50%
73	R.Z.	F.	40	L4-L5	10	50%
74	G.H	F.	29	L4-L5	9	50%
75	M.M.	M.	52	L5-Si	10	100%
76	M.S.	M.	48	L3-L4	12	50%
77	T.	M.	40	L3-L4	12	?%
78	M.Ph.	M.	38	Lombago	5	100%
79	M.H.	M.	48	L2-L3	10	100%
80	L.	M.	40	C5-C6	13	100%
81	A.R.	M.	59	L3-L4	12	100%
82	Dr.D.	M.	52	C5-C6	20	100%
83	Sh.E.M.	F.	54	L5-L6	15	?%
84	H.T.	M.	35	Knee	3	60%
85	Sh.M	F.	43	C5-C6	15	100%
86	F.B.	F.	22	L4-L5	18	60%
87	N.Kh.	M.	42	L4-L5	10	50%
88	F.H.	F.	60	L4-L5	10	50%
89	A.Sh.T.	F.	50	Knee	10	50%
90	R.Dj.	F.	60	C5-C6	11	100%
91	S.H.	F.	60	C5-C6	12	100%
92	T.A.	F.	34	L3-L4	10	100%
93	H.B.	M.	47	L4-L5	15	100%
94	T. Gh	F.	48	C5-C6		100%
95	F.	F.	40		10	60%
96	H.B.	F.	60	L3-L4	20	100%

RESULTS:

Figure I indicates the recovery rates obtained upon completion of our trial.

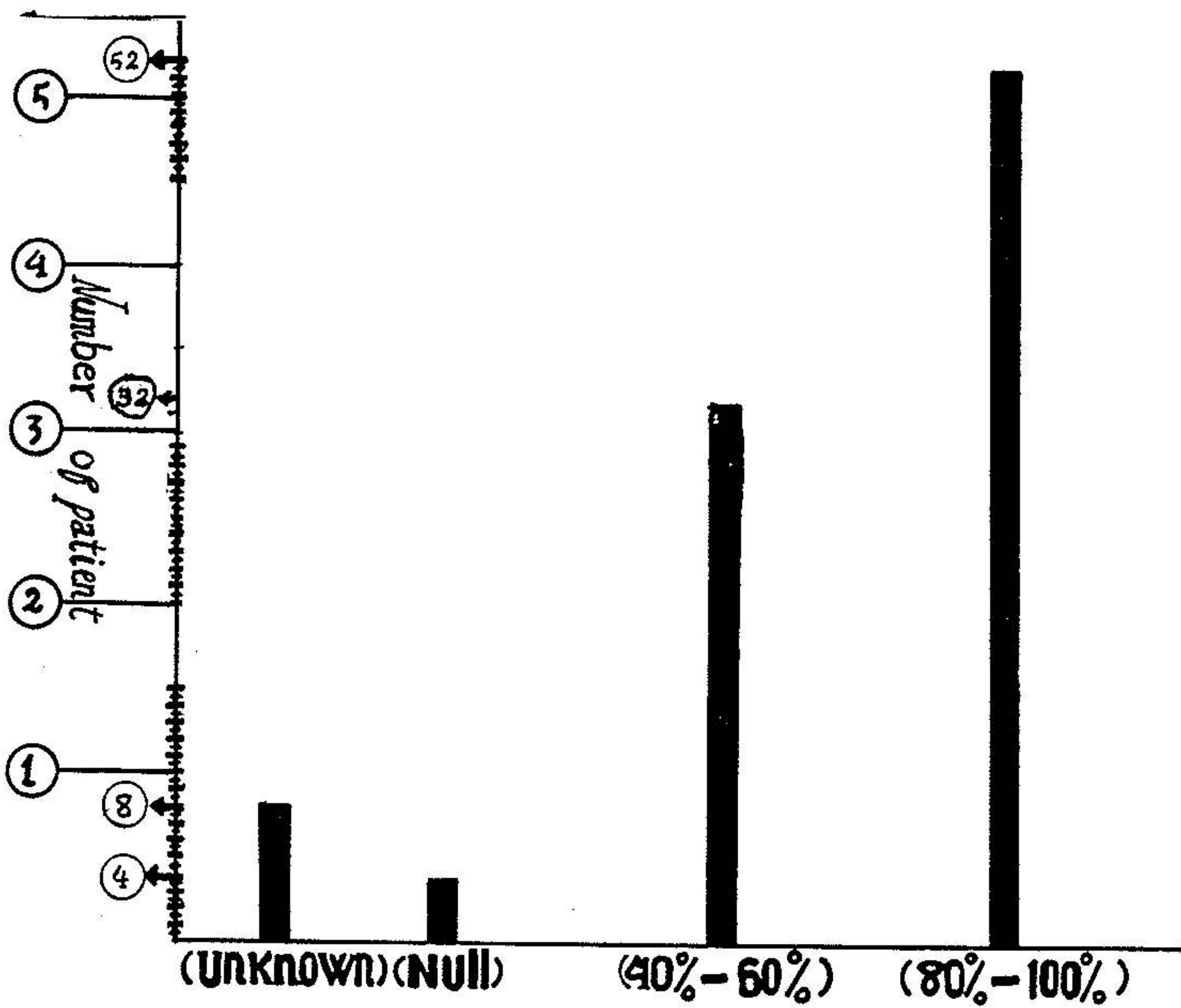


Figure I - Recovery Range.

Out of the total number of 96 patients under treatment, 52 (54%) achieved a satisfactory recovery rate while 32 patients (33%) enjoyed a lower rate of recovery and the remaining 12 patients (13%) had negative or unknown response.

Figure II reflects the age range of patients under ultrasonic therapy.

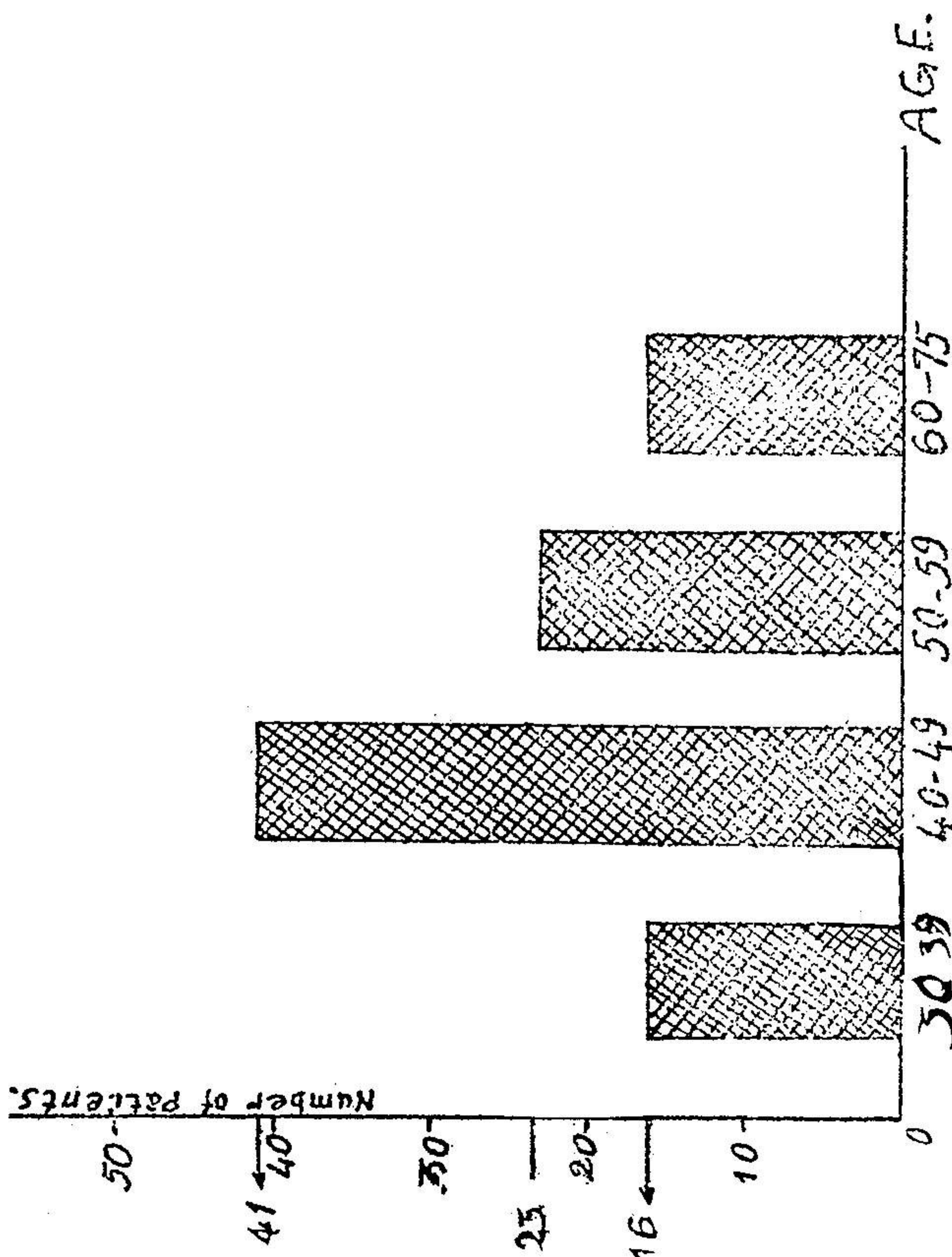


Figure II- Age Range.

As concluded from this Figure, the 40-50 age-group shows the maximum rate of involvement.

Sex ratio are as follow: Female 55 (57.4 %)

Male 41 (42.6 %)

DISCUSSION:

Throughout the period of treatment with ultrasonic waves patients were refrained from taking any kind of medicine. Patients undergoing treatment for 15 to 20 sessions showed satisfactory results on a continuous basis, with the exception of the following :

1-Patients numbers 38,11 and 39 though involved in a mild case of arthrosis, showed no significant improvement after 12 to 20 sessions of ultrasonic therapy. This, on basis of our diagnosis, could be due to their psychological state.

2-Patients numbers 28 and 53 were refrained from treatment after 15 and 20 sessions of ultrasonic therapy respectively, with no satisfactory results. Subsequent examination of these patients revealed symptoms of rheumatoid arthritis.

3- Patients numbers 31 and 67 showed relative improvement with an average recovery rate of 40 to 50 per cent. Subsequent paraclinical examinations confirmed the existance of chronic nephritis in both cases.

4- Patient number 33 suffered from diabetes and did not achieve a recovery rate of more than 30 per cent.

5- Patients numbers 40 and 58 did not show any significant improvement in spite of the fact that they had undergone 20 sessions of ultrasonic therapy. An examination of their files indicated irregular refers to the department for treatment.

The latter implies that higher rates of recovery (as compared to the present 54 % maximum and 33 % average) might have been achieved if all patients under trial had undergone 20 sessions of treatment.

Throughout the period of this trial 5 of the total number of patients

treated returned for further treatment within a period of 12 to 18 months.

We may conclude from the above description that ultrasound can be used as the most effective means in the treatment of arthrosis with respect to its significant effects on the relief of pain, spasm and the elimination of the limitation of movement.

The treatment should be given regularly and 20 treatment sessions one necessary.

The patient who suffer from kidney disease and diabets show very little response to this treatment.

SUMMARY

96 patients suffering from degenerative joint disease were treated with ultrasonic waves within a period covering December 1971 to April 1974. Out of the total number of 96 patients under treatment, 52 (54 %) achieved a satisfactory rate while 32 patients (33 %) enjoyed a lower rate of recovery and the remaining 12 patients (13 %) had negative or unknown response. The methods of action and procedure are discussed.

RÉSUMÉ

C'est un report du Département de Physique Médicale de la Faculté de Médecine de Téhéran.

Pendant ces trois dernières années, Decembre 1971 Avril 1974, nous avons suivi les effets thérapeutiques des ondes ultrasoniques sur les arthroses. 96 cas sont été traités par ces ondes, et les résultats obtenus sont bien satisfaisants (Fig. I).

Dans cet article les méthodes et les procedures sont discutés.

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