

## RESULTS

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Thirty patients attending the out patient clinic of Benha University Hospital comprised the material of this work . They were 27 females (90%) and 3 males (10%), whose ages ranged between 22 and 60 years with a mean of  $40 \pm 2.04$  years **Table (1)** .

These patients were diagnosed as having rheumatoid arthritis according to the revised criteria of the American College of Rheumatology (ACR) (*Arnette et al., 1988*) .

A control group of 20 healthy subjects age , sex and weight matched to our patient group , was also included . They were 17 females (85%) and 3 males (15%) **Table ( 2 )** .

## Results of the clinical study :

The disease duration ranged between one and 12 years with a mean of  $5 \pm 0.6$  years .

The duration of morning stiffness ranged between 15 and 120 minutes, with a mean of  $57.2 \pm 5.5$  minutes .

The functional capacity (F.C.) was as follows : Grade I, 8 patients (26.7%), grade II, 16 patients (53.3%) and grade III, 6 patients (20%) .

The muscle power for the flexor group of the right forearm muscles was normal in 12 patients (40%) and good in 18 patients (60%) .

The mini Ritchi index ranged between 0 and 9 with a mean of  $2.6 \pm 0.4$  .

The deformity index ranged between 0 and 15 with a mean of  $4.6 \pm 0.6$  (Table 3) .

The weight of the patients ranged between 45 and 90 Kgm with a mean of  $69.4 \pm 2.2$  Kgm, while the weight of the control ranged between 60 and 94 Kgm with a mean of  $72.9 \pm 1.9$  Kgm .

The anatomical cross-sectional area (CSA) of the right forearm muscles ranged between 18.5 and 32.5  $\text{cm}^2$  with a mean of  $25 \pm 0.6$   $\text{cm}^2$  . The anatomical CSA of the control ranged between 23.8 and 36.3 with a mean of  $28.9 \pm 0.7$   $\text{cm}^2$  .

The hand function score for the right hand of the patients ranged between 7 and 40 with a mean of  $23.1 \pm 1.6$ , while that of the control group ranged between 30 and 52 with a mean of  $40.2 \pm 1.5$  . (Table 3 and 4) .

### **Results of the laboratory and radiological study :**

The erythrocyte sedimentation rate (ESR) of all the patients ranged between 30 and 125 mm in the first hour, with a mean of  $67.2 \pm 5.4$  mm / hour .

The haemoglobin concentration ranged between 8 and 14 gm/dl, with a mean value of  $10.7 \pm 0.4$  gm/dl .

The rheumatoid factor (RF) was positive in 6 patients (20%) and negative in 24 patients (80%) .

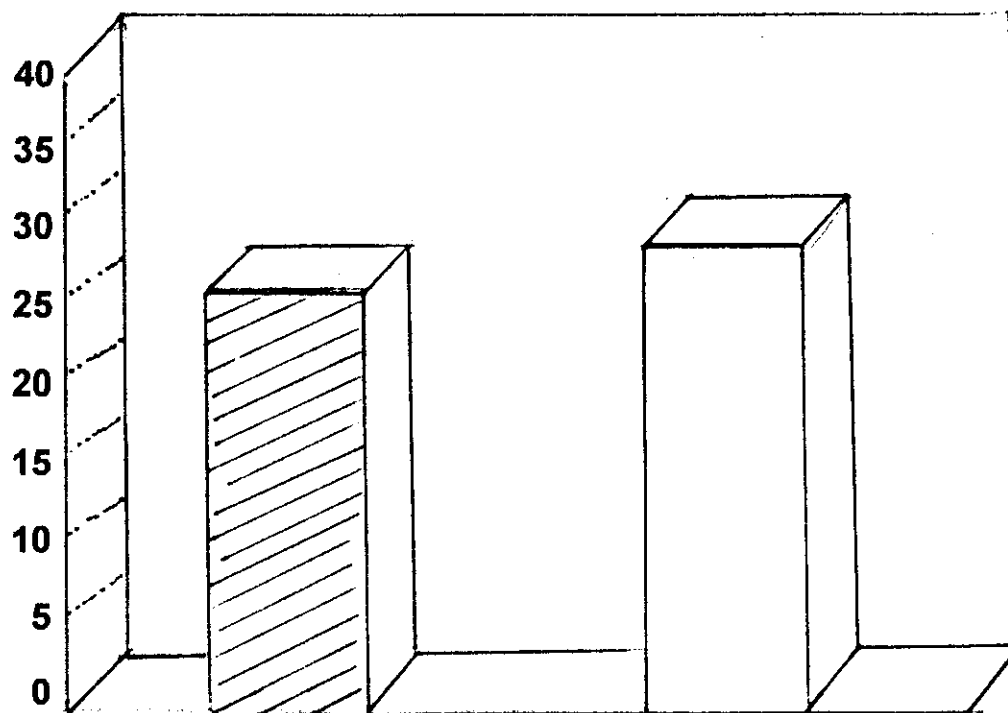
The radiological grading was stage I in 9 patients, stage II in 11 patients, stage III in 6 patients and stage IV in 4 patients (Table 5) .

## **Statistical analysis**

On statistical evaluation there was a highly significant difference ( $P < 0.01$ ) between the anatomical CSA of the patients and control **(Table 6) , (Histogram 1) .**

Statistical evaluation revealed also a highly significant difference ( $P < 0.01$ ) between the hand function score of the patients and controls **(Table 7) , (Histogram 2) .**

## Histogram (1)



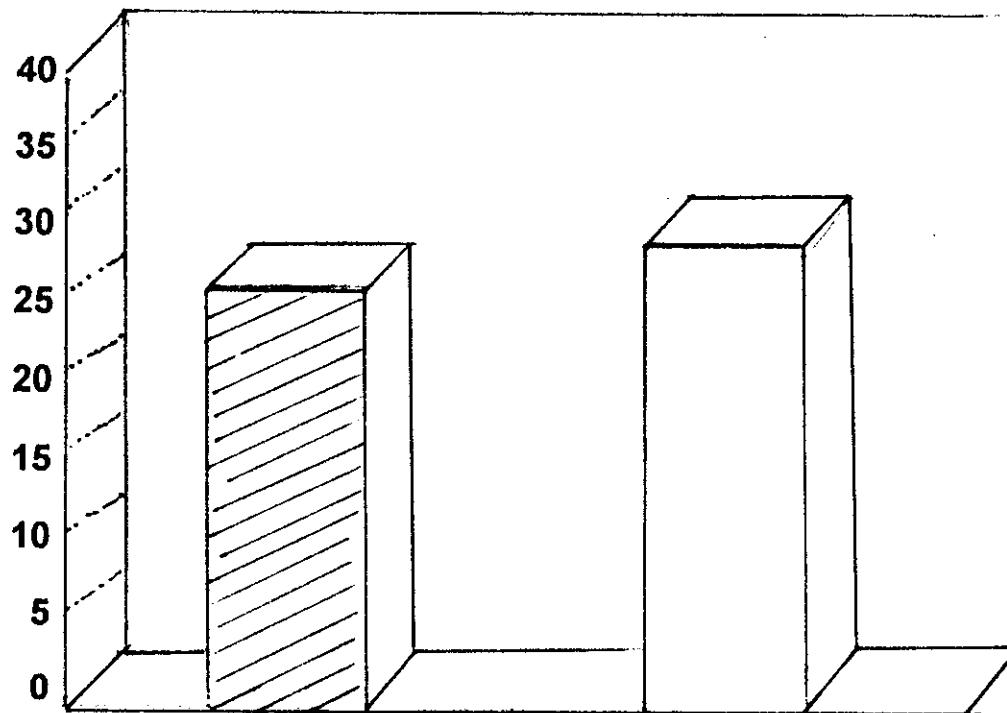
$P < 0.01$  = Highly significant

 Anatomical CSA of Cases .


 Anatomical CSA of Controles .


Comparison be between the Mean CSA of RA patients and normal controls .

## Histogram (1)



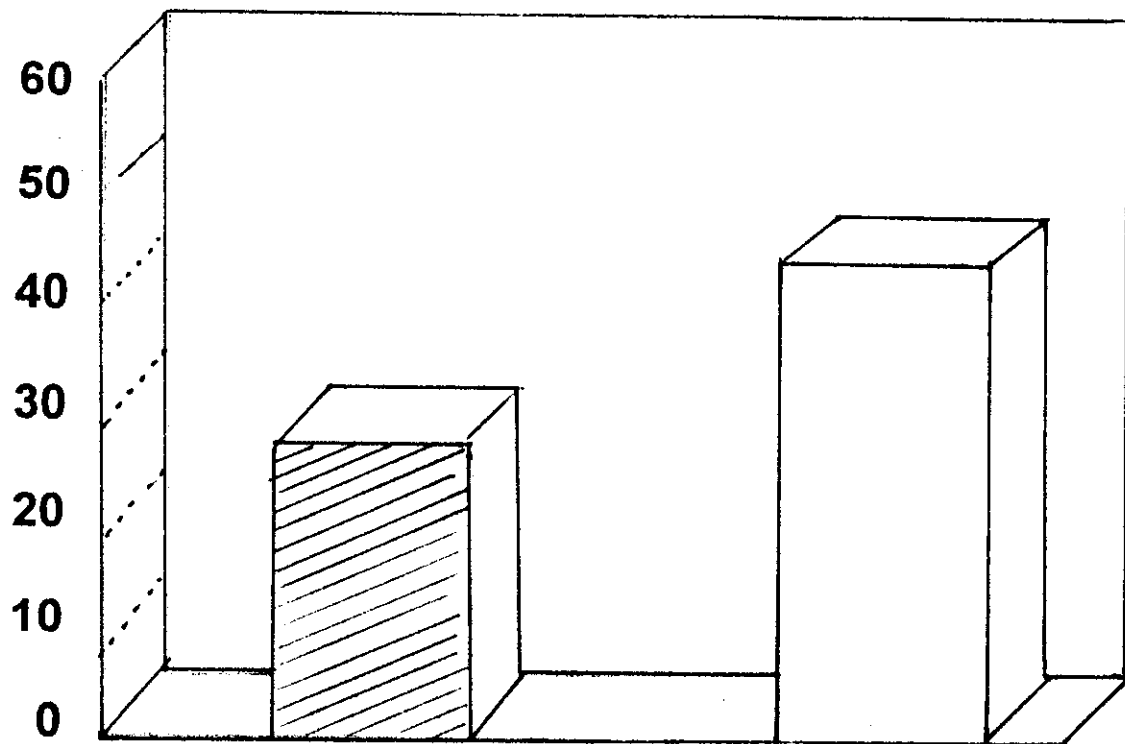
$P < 0.01$  = Highly significant

 Anatomical CSA of Cases .

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Comparison be between the Mean CSA of RA patients and normal controls .

## Histogram (2)



$P < 0.01$  Highly significant



Hand function score of cases .



Hand function score of controls .

Comparison between Mean score of hand function in RA patients and normal controls .

Statistical evaluation revealed a nonsignificant difference ( $P > 0.05$ ) between RA patients with a negative RF and RA patients with a positive RF in relation to the hand function score (**Table 11**) .

Statistical evaluation revealed also a nonsignificant difference ( $P > 0.05$ ) between RA patients with a negative RF on RA patients with a positive RF in relation to anatomical CSA (**Table 12**)

There was a highly significant difference ( $P < 0.01$ ) between the patients with normal muscle power, of the flexor group of the right forearm muscles, and those with good muscle power in relation to the hand function score (**Table 13**) .

There was significant difference ( $P < 0.05$ ) between the patients with normal muscle power and those with good muscle power in relation to anatomical CSA (**Table 14**) .



**Table (1) :** Clinical, laboratory and radiological data of RA patients

Case no.,	age years	sex	weight (Kgm)	disease duration years	morning stiffness minutes	function capacity	muscle power	CSA cm <sup>2</sup>	hand function score	mini Ritchi index	deformity index	HB% mg/dL	ESR mm/h	R.F	X- ray grading
1	60	♂	60	6	120	III	good	26	7	3	3	11	70	+ve	4
2	20	+	70	7	15	II	normal	32.5	35	0	0	9	120	-ve	1
3	35	+	80	12	60	II	good	29.5	19	1	3	14	25	-ve	3
4	18	+	65	3	15	I	normal	26.2	32	0	4	12	30	-ve	4
5	54	+	85	8	60	II	normal	27.5	21	4	5	14	30	-ve	1
6	60	+	82	12	45	II	good	25.2	25	2	3	8.9	60	-ve	3
7	55	+	60	5	90	III	good	20.5	10	2	6	14	60	+ve	3
8	30	+	61	5	60	II	normal	24.8	18	3	2	9.3	120	+ve	2
9	42	+	60	10	90	II	good	22.2	26	3	7	8	70	-ve	3
10	22	+	65	2	15	II	normal	25.4	31	4	1	14	40	-ve	2
11	40	+	70	7	60	III	good	26.5	22	2	5	8	80	-ve	2
12	39	+	77	7	60	II	good	29	22	5	5	12	60	+ve	2
13	45	+	80	1	15	I	good	30	40	1	3	8	30	-ve	1
14	33	♂	62	6	30	I	normal	25.7	38	1	5	8	100	-ve	2
15	37	♂	50	5	60	II	normal	25.2	21	3	7	9.6	125	-ve	4
16	35	+	72	5	70	II	normal	22.3	26	5	1	10.6	110	-ve	2
17	43	+	70	7	120	II	good	21.8	7	4	7	12	70	-ve	2
18	38	+	65	3	30	II	good	20.3	22	1	2	12	40	-ve	2
19	51	+	83	2	15	I	normal	25	33	2	6	13.5	55	-ve	1
20	22	+	45	2	60	III	good	19.7	27	2	7	8.5	120	+ve	3
21	40	+	65	5	120	II	good	26.3	7	0	2	9.8	75	-ve	2

Case no.,	age years	sex	weight (Kgm)	disease duration years	morning stiffness minutes	function capacity	muscle power	CSA cm <sup>2</sup>	hand function score	mini Ritchi index	deformity index	HB% mg/dL	ESR mm/h	R.F	X-ray grading
22	35	+	65	8	15	II	normal	22.5	32	1	9	9.2	60	-ve	2
23	42	+	70	3	60	I	good	24	22	3	3	10.2	50	+ve	1
24	46	+	80	4	90	I	good	28.8	21	3	0	12	75	-ve	1
25	50	+	45	2	90	III	good	19.5	12	3	12	9	80	-ve	3
26	53	+	90	1	60	I	good	27.7	29	9	5	15	50	-ve	1
27	34	+	65	1	15	I	normal	24.3	30	1	6	14	30	-ve	1
28	49	+	90	3	45	II	normal	27.5	23	0	3	12.5	60	-ve	1
29	39	+	65	6	60	III	good	18.5	18	6	15	9.5	70	-ve	4
30	48	+	85	5	70	II	good	24.7	17	4	7	9.5	65	-ve	2
X	40.5	-	69.4	4.9	57.2	-	-	24.9	22.9	2.6	4.6	10.7	67.5	-	-
SD	11.2	-	11.9	3.4	32.8	-	-	3.4	8.7	2.2	3.4	2.2	29.6	-	-
SE	2	-	2.2	.6	5.5	-	-	6	1.6	4	.6	0.4	5.4	-	-

X = Mean .

SD = Standard deviation .

SE = Standard error .

**Table (2) : Clinical, laboratory and radiological data of controls .**

<b>Number</b>	<b>Age years</b>	<b>Wight Kg</b>	<b>CSA</b>	<b>Hand function</b>
1	30	65	23.8	40
2	40	94	36.3	47
3	22	62	29.8	41
4	42	80	29	46
5	22	70	26.4	33
6	40	80	33.5	42
7	39	65	31.5	39
8	51	72	29.3	40
9	45	75	28.2	47
10	33	85	31.1	52
11	55	70	28.2	49
12	18	72	29.3	40
13	35	80	33.5	39
14	60	60	26.5	24
15	37	70	28.2	40
16	33	80	27.5	39
17	20	70	26.4	31
18	60	64	27	33
19	35	65	24.5	30
20	38	80	29	46
Mean	37.8	72.9	28.9	40.2
SD	12.3	8.7	3	6.7
SE	2.8	1.9	0.7	1.5

SD = standerd deviation .

SE = standerd error .

**Table (3) :** Descriptive data of the clinical variables of RA patients .

	<b>Range</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>
<b>Age (years)</b>	22 - 60	40.5	11.9	2
<b>Weight (Kgm)</b>	45 - 90	69.4	12	2.2
<b>Disease duration (years)</b>	1 - 12	5	3.4	0.6
<b>Morning stiffness (minutes)</b>	15 - 120	57.2	32.9	5 - 5
<b>Functional capacity</b>	I - III			
<b>CSA (cm2)</b>	18.5 - 32,5	25	3.4	.6
<b>Hand function score</b>	7 - 40	23.1	8.7	1.6
<b>Mini ritchi index</b>	0 - 9	2.6	2.2	.4
<b>Deformity index</b>	0-15	4.6	3.4	.6
<b>Muscle power</b>	good- normal			

SD = standerd deviation .

SE = standerd eror .

CSA = Cross - sectional area .

**Table (4) :** Descriptive data of the clinical variables of the controls .

	<b>Range</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>
<b>Age (years) .</b>	18-60	37.8	12.3	2.8
<b>Weight (Kgm) .</b>	60-94	72.9	8.7	1.9
<b>CSA (Cm2) .</b>	23.8 - 36.3	28.9	3.1	.7
<b>Hand function score .</b>	30 - 52	40.2	6.7	1.5

**Table (5) :** Descriptive data of the laboratory and radiological variables of RA patients .

	<b>Range</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>
<b>HB% (gm /dl) .</b>	8-14	10.7	2.2	.4
<b>E.S.R .</b>	30-125	67.5	29.6	5.4
<b>Radiological grading .</b>	1-4	2.2	1	0.1

**Table (6) :** Comparison between the anatomical (CSA) of cases and control .

	Mean	SD	SE	t	P
Cases .	24.97	3.4	.62	4.21	< 0.01 HS
Controls .	28.95	3.08	.69		

HS = highly significant

**Table (7) :** comparison between hand function score of cases and controls .

	Mean	SD	SE	t	p
Cases .	23-1	8.87	1.62	7.33	<0.01 HS
Controls .	40.2	6.7	1.5		

Hs = highly significant .

**Table (9) :** Correlation coefficient between the hand function score with the clinical , laboratory and rachiological data .

	<b>R</b>	<b>P</b>
<b>Age .</b>	- .42	< 0.05 S
<b>Weight .</b>	- .27	> 0.05 NS
<b>Disease duration .</b>	- .2	> 0.05 NS
<b>Morning stiffness .</b>	- .87	< 0.01 HS
<b>Mini Ritchi index .</b>	- .39	< 0.05 S
<b>Deformity index .</b>	- .42	< 0.05 S
<b>E S R</b>	- .08	> 0.05 NS
<b>Radiological grading</b>	- .36	< 0.05 S

NS = non significant .

S = Significant .

HS = highly significant .

**Table (10) :** Correlation coefficient between the anatomical CSA and the hand function score .

	Mean	R	P
Hand function score .	22.9 ± 1.6	.33	> 0.05 NS
Anatomical CSA .	25 ± .6		

NS = non significant .

**Table (11) :** Comparison between RF positive and RF negative patients in relation to the hand function score .

RF	Number of cases	Mean of hand function score	T	P
RF - ve	24	24.5 ± 1.8	1.73	> 0.05 NS
RF + ve	6	17.7 ± 3.2		

NS = non significant .



**Table (14) :** Comparison between normal and good muscle power patients in relation to the anatomical CSA .

<b>Muscle grade</b>	<b>Number of cases</b>	<b>Mean CSA</b>	<b>T</b>	<b>P</b>
<b>Good .</b>	18	25.1 $\pm$ 1.8	- 2.25	< 0.05 S
<b>Normal .</b>	12	23.9 $\pm$ 2.4		

S = Significant .