RESULTS

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A- Results of clinical study:

This study was carried out on 20 patients suffering from R.A. diagnosed according to the classification criteria of the American Collage of Rheumatology *(Arnett et al., 1988).*

Out of the 20 patients 15 were females (75%) and 5 were males (25%). Their ages ranged between 25 and 65 years with a mean age of 44.8 years with standard deviation (S.D ± 11.913).

The disease duration ranged between 3 years and 15 years with a mean duration of 8.2 years (S.D. ± 3.254). As regards the duration of morning stiffness it ranged between 30 minutes and 120 minutes with a mean of 63.0 minutes (S.D. ± 28.809). The MDGA, was grade II in 1 patient (5%), grade III in 18 patients (90%) and grade IV in 1 patient (5%). On calculating the articular index for the whole body according to the modified Ritchie articular index, it ranged between 10 and 67 with a mean of 28.5 (S.D. ± 4.671).

The grip strength in either hands ranged between 10 and 50mmHg with an average of 27.7 mmHg (S.D. ± 3.692) in the right hand and 22.9 mmHg (S.D. ± 3.154) in the left hand.

The articular index of the hands ranged between 9 and 18 with a mean of 11.8 (S.D. ± 2.852). According to the presence of deformities there were 7 patients (35%) with no hand deformities and 13 patients (65%) showing hand deformities. The ulnar deviation deformity was seen

in 5 patients (38%), Swan-neck deformity was noticed in 8 patients (61.5%), buttonaire deformity was found in 6 patients (46.1%) and Z-thumb deformity was elicited in 3 patients (23%).

B- Results of laboratory study:

In the 1st hour, the erythrocyte sedimentation rate ranged between 40 mm and 90 mm, with an average value of 61.2 (S.D. ± 14.768). According to Hb it ranged between 9 g/dl and 12 g/dl with an average 10.8 g/dl (S.D. ± 1.148). All patients were sero +ve.

C- Results of radiological study:

I- X-ray hand:

Only 2 patients (10%) were non-erosive while 18 patients (90%) were erosive.

II- Ultrasonographic evaluation:

A sonographically detectable tendon involvement was found in 18 RA patients (90%).

Only 4 patients (20) showed a single alteration while two patients (10%) showed 2 alternations and 12 patients (60%) showed a combination of 3 or 4 ulterations of the normal pattern.

The main sonographic abnormality was widening of the tendon sheeth in 16 patients (80%), loss of the normal fibrillar echotexture in 12 patients (60%) irregularity of tendon margin in 10 patients (50%) synovial cyst in 4 patients (20%), tendon nodule in 3 patients (15%) and tendon tear in 2 patients (10%).

15 normal candidate undergo to ultrasonographic examination of the tendons of the hands which revealed normal tendons with no abnormalities.

Table (1): Demographic, clinical, laboratory & sonographic features in 20 patients with rheumatoid arthritis.

Patients No. / Features	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sex	F	F	M	F	F	F	M	F	F	F	F	M	F	F	M	F	M	F	F	F
Age in y.	42	35	45	65	60	45	60	27	65	30	55	46	32	40	45	25	43	49	50	38
MS	60	45	30	90	120	30	60	45	90	30	60	90	45	120	60	30	60	30	90	45
Duration in y.	5	5	8	10	15	9	8	5	15	6	10	6	5	7	10	3	8	12	10	7
MDGA	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	III	II	III	IV	III
ESR	50	80	55	70	55	40	60	45	70	60	40	60	80	80	70	70	40	50	90	60
RF	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve
x-ray hand	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.	Non	Non	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.	Eros.
AIH	12	10	10	18	16	10	11	9	12	10	9	15	11	18	11	10	9	12	14	10
Sheath widening																				
Thickening	-	-	-	-	-	-	+	+	+	-	+	+	+	+	+	-	-	+	-	+
Effusion	+	+	+	+	-	+	-	-	+	-	-	-	-	-	-	+	-	+	-	+
Loss of echatect.	+	+	-	+	-	+	-	+	+	-	-	+	-	+	-	+	+	+	+	-
Tendon Margin Irrequlity	+	+	+	+	-	+	-	+	+	-	-	-	-	+	-	-	+	+	-	-
Cyst	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+
Nodule	+	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
Tendon tear	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-

Table (2): Distribution of the studied group according to ultrasonogaphic evaluation. (Fig. 1)

Ultrasonography	+ve		-ve	
	No.	%	No.	%
Sheath widening:				
Thickening	10	50.0	10	50.0
Effusion	9	45.0	11	55.0
Loss of echotect	12	60.0	8	40.0
Tendon margin irregularity	10	50.0	10	50.0
Cyst	4	20.0	16	80.0
Nodule	4	20.0	16	80.0
Tendon tear	2	10.0	18	90.0

Fig. 1 : Disribution of the studied groups according to ultrasonographic evaluation

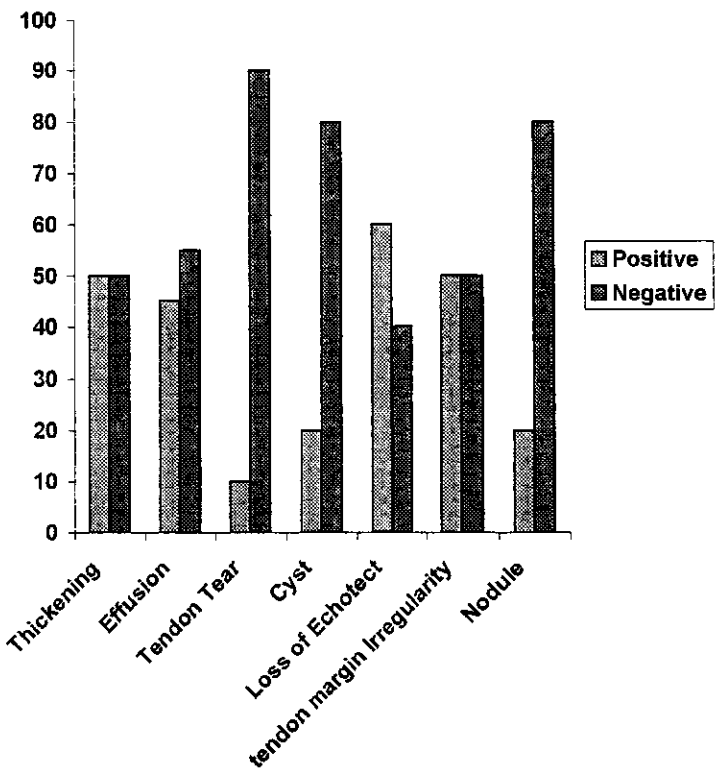


Table (3): Correlation between synovial sheath thickening of the finger tendons revealed by sonographic examination and other variables. (Fig. 2)

Sheath thickening / Other variables	r	P
Sex	0.01154	>0.05
Age	0.02265	> 0.05
Morning stiffness	0.5664	< 0.05
Duration of disease	0.4827	< 0.05
Total articular index	0.01647	> 0.05
MDGA	0.0117	> 0.05
ESR	0.02264	> 0.05
Presence of hand deformities	0.4413	< 0.05
Erosive changes in x-ray hand	0.5446	< 0.05
AIH	0.02871	> 0.05

Significant correlation between (morning stiffness, disease duration, presence of hand deformities and erosive changes in x-ray hand) and sheath thickening ($P < 0.05$) with no significant correlation to the other variables ($P > 0.05$).

Fig. 2 : Correlation between synovial sheath thickneing of the finger tendons revealed by sonography and other variables

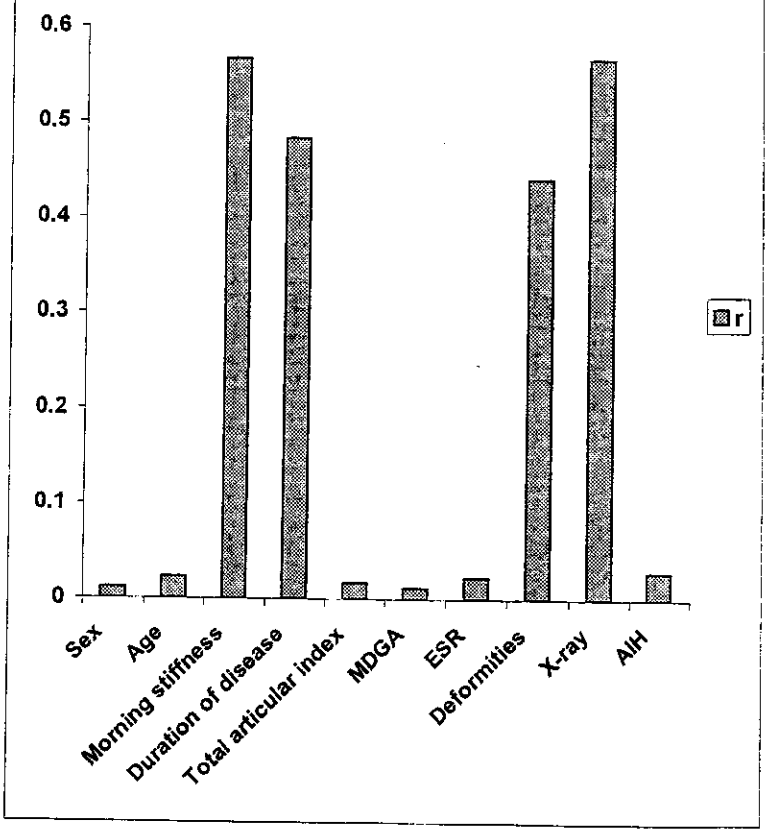


Table (4): Correlation between synovial sheath effusion of the finger tendons revealed by sonographic examination and other variables. (Fig. 3)

Sheath effusion / Other variables	r	P
Sex	0.01326	>0.05
Age	0.03714	>0.05
Morning stiffness	0.6734	< 0.05
Duration of disease	0.5338	< 0.05
Total articular index	0.02273	> 0.05
MDGA	0.02334	> 0.05
ESR	0.01182	> 0.05
Presence of hand deformities	0.5732	< 0.05
Erosive changes in x-ray hand	0.5529	< 0.05
AIH	0.01364	> 0.05

Significant correlation between (morning stiffness, disease duration, presence of hand deformities and erosive changes in x-ray hand) and sheath effusion ($P < 0.05$) in significant correlation between the other variables ($P > 0.05$).

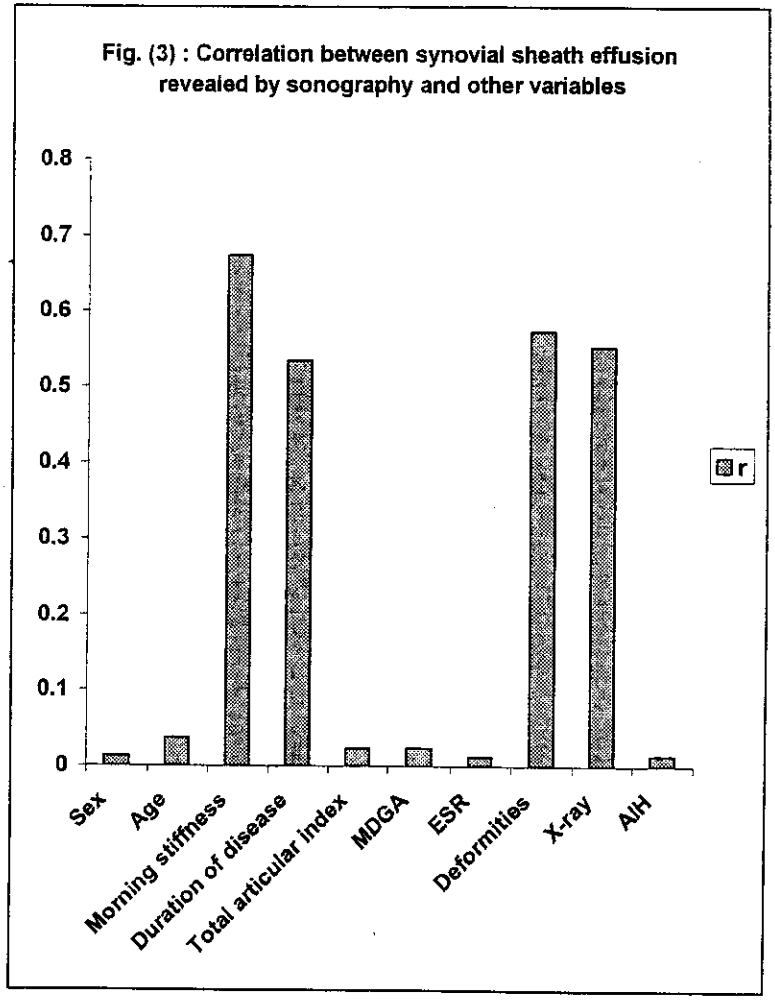


Fig. (3) : Correlation between synovial sheath effusion revealed by sonography and other variables
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
r
Sex
Age
Morning stiffness
Duration of disease
Total articular index
MDGA
ESR
Deformities
X-ray
AIH

Table (5): Correlation between loss of normal fibrillar echotexture of the finger tendons revealed by sonographic examination and other variables. (Fig. 4)

Loss of normal fibrillar echotexture / Other variables	r	P
Sex	0.0218	>0.05
Age	0.01364	> 0.05
Morning stiffness	0.02281	< 0.05
Duration of disease	0.4413	< 0.05
Total articular index	0.03151	> 0.05
MDGA	0.0117	> 0.05
ESR	0.0125	> 0.05
Presence of hand deformities	0.3764	< 0.05
Erosive changes in x-ray hand	0.4773	< 0.05
AIH	0.0267	> 0.05

Significant correlation between (disease duration, presence of hand deformities, erosive changes in x-ray hand) and loss of echotexture of the tendon ($P < 0.05$) and insignificant correlation to the other variables ($P>0.05$).

Fig. 4 : Correlation between loss normal fibrillar echotexture of the finger tendons revealed by sonography and other variables

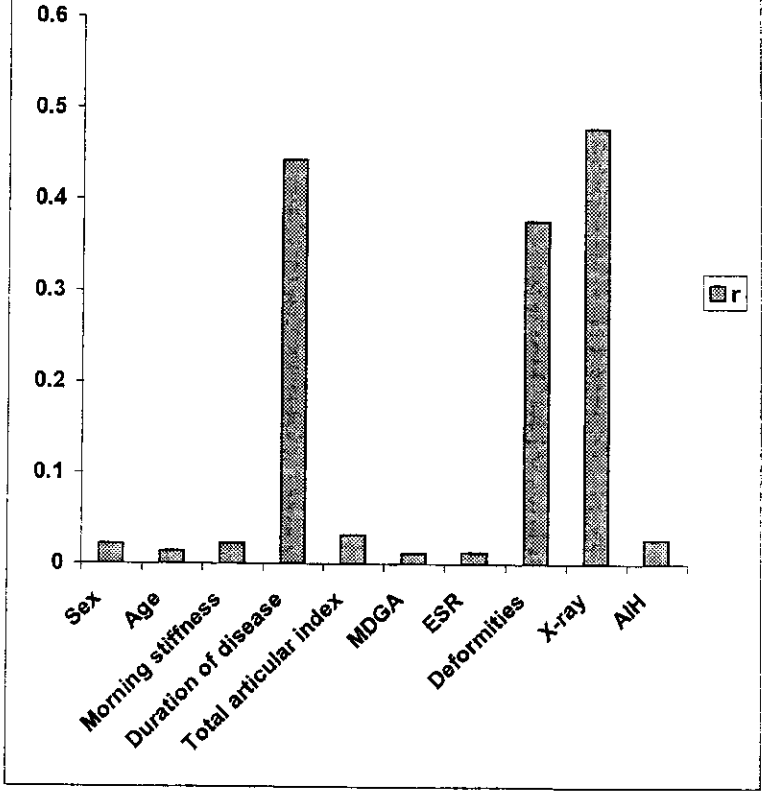


Table (6): Correlation between tendon margin irregularity of the finger tendons revealed by sonographic examination and other variables. (Fig. 5)

Tendon margin irregularity / Other variables	r	P
Sex	0.01664	>0.05
Age	0.02281	> 0.05
Morning stiffness	0.01682	> 0.05
Duration of disease	0.3827	< 0.05
Total articular index	0.0467	> 0.05
MDGA	0.01128	> 0.05
ESR	0.0126	> 0.05
Presence of hand deformities	0.02447	> 0.05
Erosive changes in x-ray hand	0.5524	< 0.05
AIH	0.0229	> 0.05

Significant correlation between (disease duration, erosive changes in x-ray hand) and tendon margin irregularity ($P < 0.05$) and insignificant correlation to the other variables ($P > 0.05$).

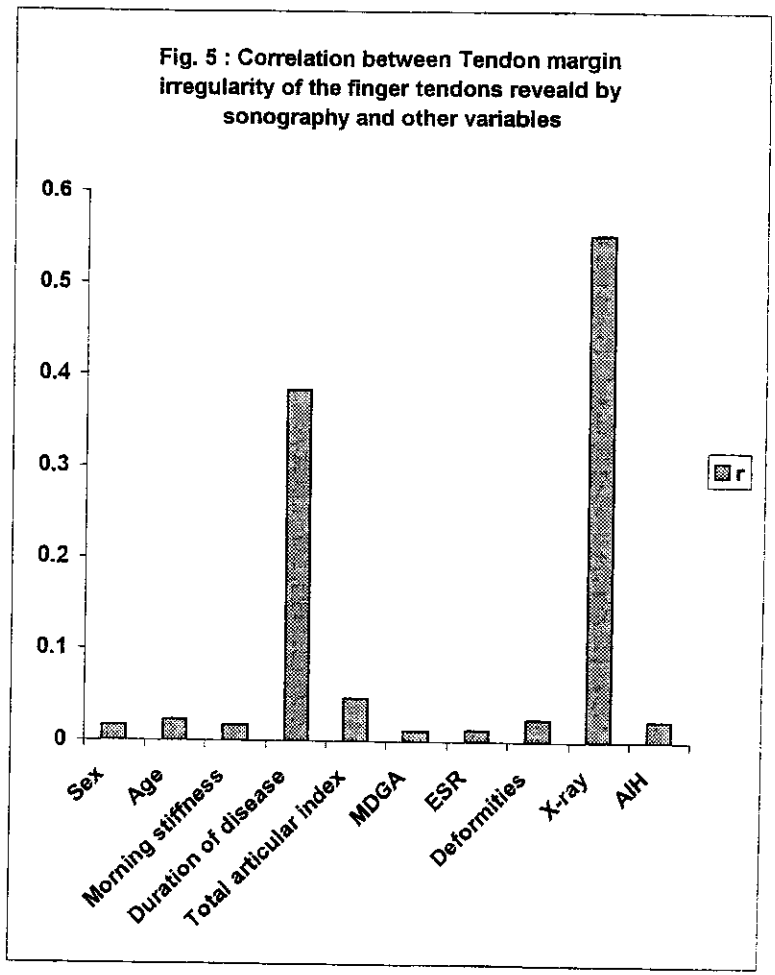


Fig. 5 : Correlation between Tendon margin irregularity of the finger tendons reveald by sonography and other variables
0.6
0.5
0.4
0.3
0.2
0.1
0
r
Sex
Age
Morning stiffness
Duration of disease
Total articular index
MDGA
ESR
Deformities
X-ray
AIH

Table (7): Correlation between synovial cyst of the finger tendons revealed by sonographic examination and other variables. (Fig. 6)

Synovial cyst / Other variables	r	P
Sex	0.0227	>0.05
Age	0.01164	> 0.05
Morning stiffness	0.0227	> 0.05
Duration of disease	0.0116	> 0.05
Total articular index	0.01226	> 0.05
MDGA	0.01134	> 0.05
ESR	0.02247	> 0.05
Presence of hand deformities	0.01339	> 0.05
Erosive changes in x-ray hand	0.02268	> 0.05
AIH	0.01146	> 0.05

Insignificant correlation between all variables and synovial cyst (P>0.05).

Fig. 6 : Correlation between synovial cyst of the finger tendons reveald by sonography and other variables

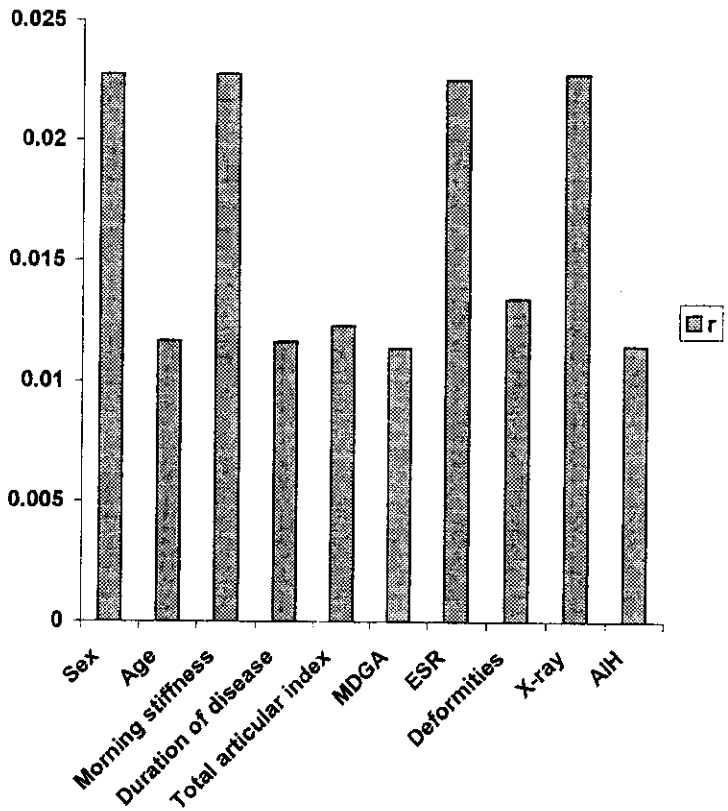


Table (8): Correlation between rheumatoid nodule of the finger tendons revealed by sonographic examination and other variables. (Fig. 7)

Rheumatoid nodule / Other variables	r	P
Sex	0.01434	> 0.05
Age	0.02266	> 0.05
Morning stiffness	0.01352	> 0.05
Duration of disease	0.0246	> 0.05
Total articular index	0.01224	> 0.05
MDGA	0.01123	> 0.05
ESR	0.02337	> 0.05
Presence of hand deformities	0.01154	> 0.05
Erosive changes in x-ray hand	0.02336	> 0.05
AIH	0.01224	> 0.05

Insignificant correlation between all variables and presence of rheumatoid nodule ($P > 0.05$).

Fig. 7 : Correlation between Rheumatoid nodule in the finger tendons revealed by sonography and other variables

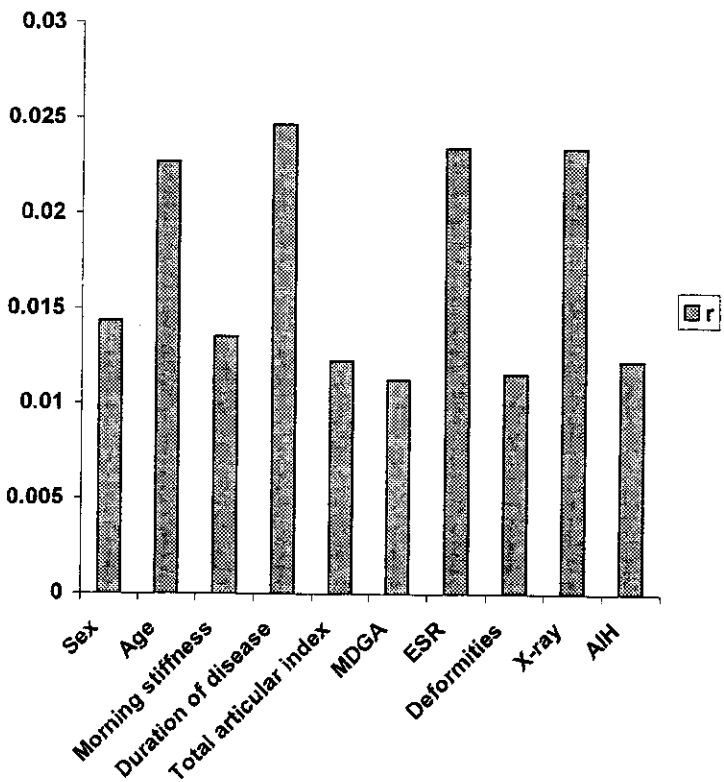
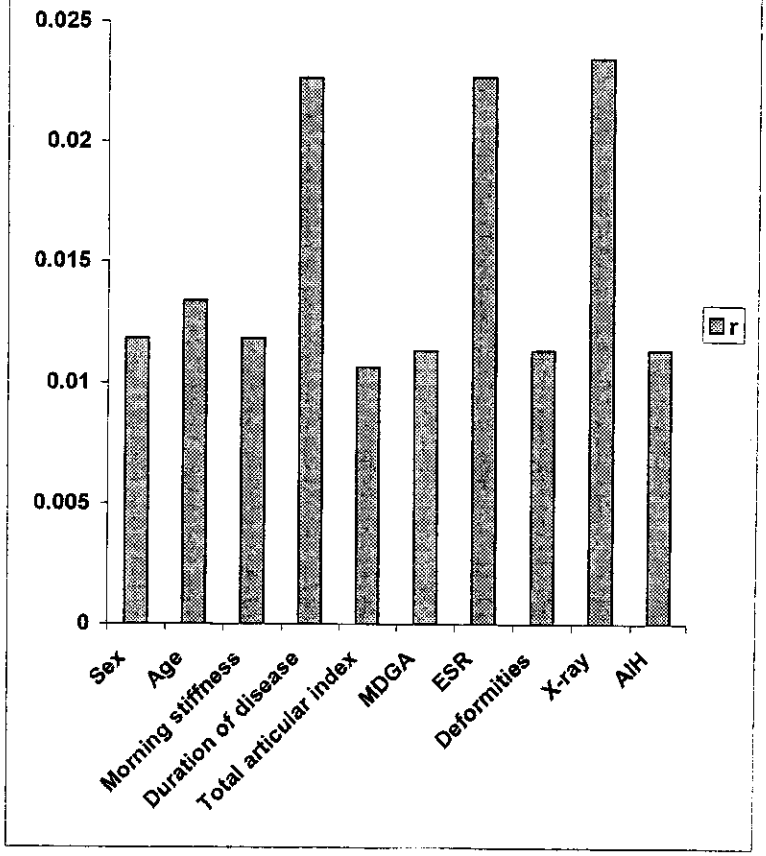


Table (9): Correlation between finger tendon tear revealed by sonographic examination and other variables. (Fig. 8)

Tendon tear / Other variables	r	P
Sex	0.01184	>0.05
Age	0.01335	> 0.05
Morning stiffness	0.01183	> 0.05
Duration of disease	0.02264	> 0.05
Total articular index	0.01068	> 0.05
MDGA	0.01136	> 0.05
ESR	0.02268	> 0.05
Presence of Deformities	0.01136	> 0.05
Erosive changes in x-ray hand	0.02344	> 0.05
AIH	0.01136	> 0.05

Insignificant correlation between all variables and tendon tear (P>0.05).

Fig. 8 : Correlation between finger tendon tear revealed by sonography and other variables



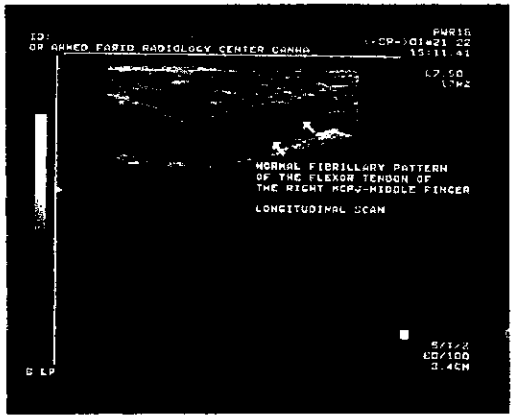


Fig. (9)
HRUS illustrate normal fibrillary pattern of the flexor tendon of the right MCP joint-middl finger longitudinal scan(arrows).

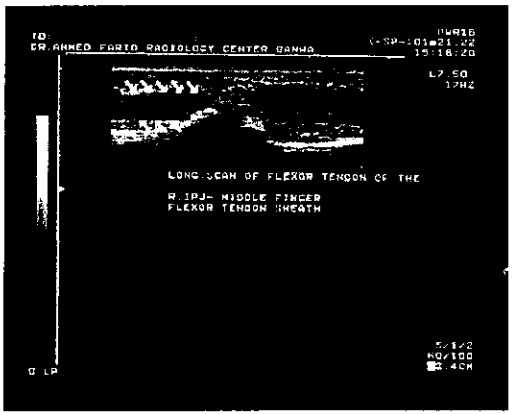


Fig. (10)
HRUS long scan of flexor tendon of the right PIP joint-middle finger illustrate flexor tendon sheath (arrows).

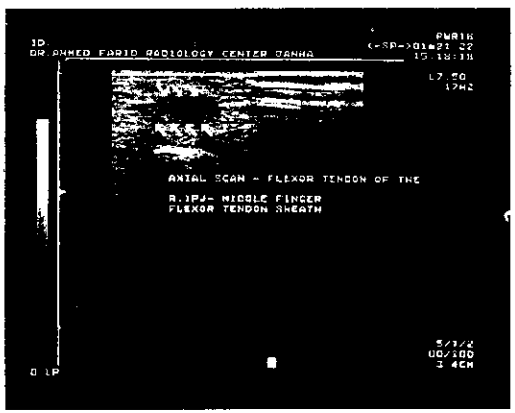


Fig. (11)
HRUS axial scan - flexor tendon of the right IPJ-midlle finger flexor illustrate tendon sheath (arrows).

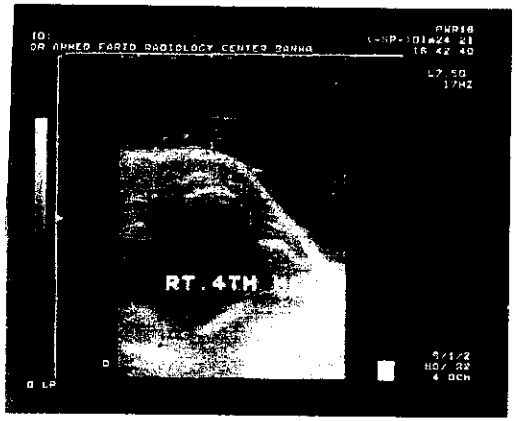


Fig. (12)
HRUS of the right 4th MCP joint Transverse palmar scan illustrate tendon sheeth thickening with normal fibrillar preservation.

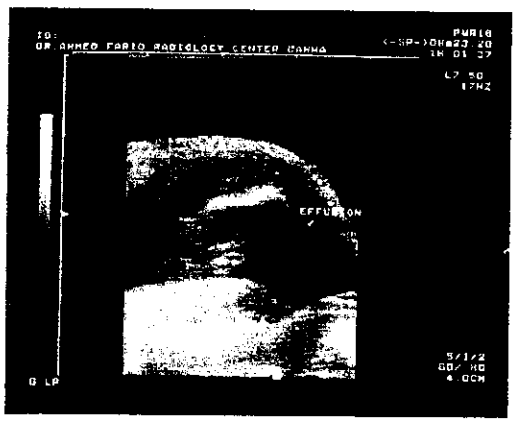


Fig. (13)
HRUS illustrate flexor tendon effusion with tendon sheeth widening and diffuse hypoechoic texture of the 2nd MCP joint (arrow).

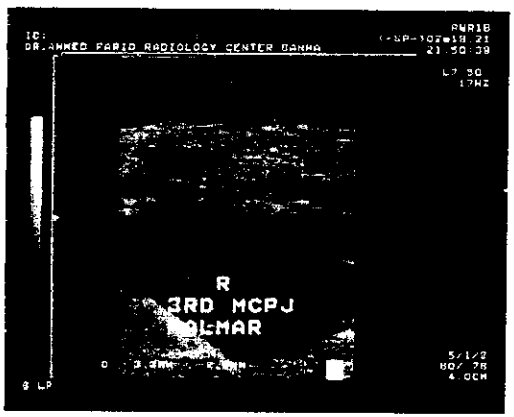


Fig. (14)
HRUS palmar longitudinal scan of the 3rd MCP joint illustrate irregular tendon thickening with diffuse hypoechoic texture suggesting localised tendinitis.

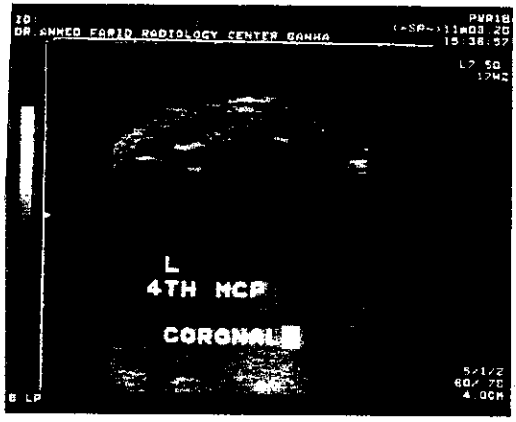


Fig. (15)
HRUS coronal scan of the left 4th MCP joint illustrate tendon margin irregularity.

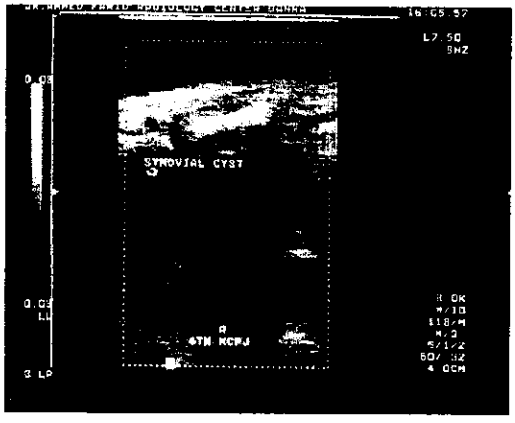


Fig. (16)
HRUS palmar longitudinal scan illustrate synovial cyst at the level of 4th MCP joint in the form of small anechoic cystic lesion in the flexor tendon (arrow).

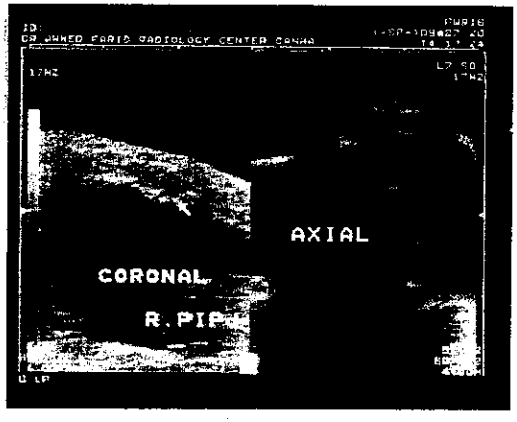


Fig. (17)
HRUS coronal and axial scans of the right PIP joint illustrate hypoechoic nodule formation in the flexor tendon (arrow).

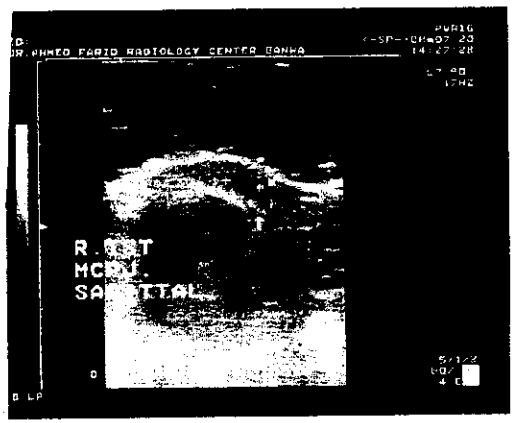


Fig. (18)
HRUS sagittal scan of the right 1st MCP joint illustrate a short longitudinal hypoechoic flexor tendon tear (arrow).