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**RESEARCH ARTICLE**

**IDIOPATHIC CARPAL TUNNEL SYNDROME ( I.C.T.S.) CLINICAL AND  
 ELECTROPHYSIOLOGICAL EVALUATION IN IRAQI PATIENTS.**

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**Abstract**

**Introduction:** carpal tunnel syndrome ( C.T.S ) is a world wide disease which affects 5-10 % of population with a variable distribution rate among persons depending on their sex , age , occupation and precipitating factors ( in secondary C.T.S ) .It usually affects adults , females more than males It has variable modes of presentation and variable ways of alleviating the symptoms .

This study aimed at evaluation of I.C.T.S both clinically and electrophysiologically in Iraqi patients .

**Patients and Methods :** 54 Iraqi patients with 77 hands affected by I.C.T.S ( Secondary C.T.S cases were excluded ) were received in rheumatology consultation clinic /AL- Yarmouk Teaching Hospital /Baghdad along 4 months period , and were evaluated (thoroughly) regarding age , sex , occupation , clinical , and electro-phys. abnormalities . Results were compared with other studies from other populations .

**Results :** most of our patients were middle age – females doing heavy house – wife activities with chief presenting complaint of hyperesthesia. Clinically less wasting but more weakness than in other studies Electro-phys, results were comparable to other studies regarding DML and SAP but with a lower incidence of spontaneous activity among our pts.

**Conclusion :** I.C.T.S . / Iraqi pts. is widely comparable to other studies ( from different parts of the world ) a part from less wasting of thenar muscles and lower % of spontaneous activity in electro – phys .study.

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**Introduction:-**

C.T.S. is an entrapment neuropathy at the wrist It can be primary ( idiopathic)= (I.C.T.S.) or secondary due to different causes . Clinically both types are the same . The main presenting symptoms are pain , numbness and tingling in the median nerve territory ( thumb , index, middle finger + half of the ring finger) in the hand . They typically start gradually and during the night , pain may extend up the arm . Weak grip strength may occur late in disease .

Thenar muscles may waste away in < 50 % of patients with chronic C.T.S<sup>2,3,4,5,6,7,8</sup>

In many pts. C.T.S is Bilateral<sup>9</sup> .The syndrome is diagnosed by : symptoms , specific physical tests ( Phalen .Tinel ) , electrodiagnostic study and musculo – skeletal ultrasound (m-sk U/S)<sup>1,10,11,13,15,16,17,20</sup> .

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**I. PATIENTS AND METHODS :**

54 pts ( with 77 affected hands ) presented to our consultation clinic along 4 months period with symptoms suggestive of C.T.S

All pts. were evaluated clinically by :

Phalens tests , Tinels test ,pin prick sensation ( comparing Median nerve supplied area with tip of little finger ), wasting of thenar muscles and power examination for both abductor pollicis brevis (A.P.B.) and Opponens pollicis (Op.P.).All cases of secondary C.T.S .were excluded (pregnancy, contraceptive pills , D.M., acromegaly, hypothyroidism , trauma, OA changes, inflammatory dis. (like R.A) ,P.N.P and M.N.M ) by questioning , and different lab tests ( CBC + ESR , F.B.S . thyroid function test etc). X- Ray and m –sk U/S of the wrist were done to exclude traumatic causes (e.g lunate fracture )and osteoarthritic changes .

Each pt.was questioned about :

1-Duration of sympts . , distribution area ,severity of sympts (by visual analog scale : V.A.S.)

2-Detailed questionnaire about different presenting sympts. Including : tightness , puffiness , clumsiness and paresthesia .

3-What relieves the pts sympts .

Lastly pts , were subjected to ENG /EMG study for both median and ulnar nerves in each affected hand : DML , NCV , SAP-L and SAP- Amp. for median n while only SAP-L and SAP-Amp for ulnar n . ( to exclude any possibility of P.N.P.)

C.T.S was diagnosed if :

1-DML < 4.1 m sec .

2-SAP – Latency< 3.7 msec ( using surface ring electrodes )

3.SAP- Amp /median n : SAP-Amp /ulnar n. => 1

**Results:-**

54 pts. :31 with Unilat C.T.S ( affecting the dominant hand) and 23 with Bilat C.T .S.

Analysis of our total77 hands with I.C.T.S showed :

*Table 1 : According to sex ,age , occupation*

Sex distribution 94 % Female 6% Male

Age 23-60 years ( mean age 38 years )

Occupation :

House wife	76 %
Teacher	9.2 %
Clerk	5.5 %
Labourer	5.5 %
farmer	1.9 %

*Table 2 : Presenting sympts*

Tingling	85.7 %
Tightness	90.9 %
Numbness	100 %
Soreness	90.9 %
Burning	40 %
Puffiness	57 %
Coldness	15.6 %
Clumsiness	66 %
N nocturnal worsening	84.4 %
Proximal referral	80.5 %

**Table 3:** According to signs / physical exam.

ve phalens test found in 74+ %
ve Tinels test found in 80.5% + %
Hypoesthesia found in 46.8 %
Hyperesthesia found in 14.2 %
Wasting found in 6.9 %
Weakness found in 62.3 %

**Table 4:** sympts were relieved by:

Hanging hands down	50 %
Massage	85 %
Execiese	83.3 %
Shaking	68.5 %
Slapping	18.5 %
Immersing / hot water	13 %
Putting on cold surface	3.7 %
Elevation of hand	3.7 %
bandaging	3.7 %

**Table 5:** Symptomes distributions / Hands

Whole hand	48 %
Index middle finger	27 %
Only middle finger	10.3 %
Median n distrib	9 %
Middle and ring finger	5 %

**Table 6:** Frequency of electrophysiological abn.

.Spont.act	9 %
Prolonged DML	79 %
L-Prolonged SAP	91 %
Amp–Decreased SAP	41.5 %
not obtained –SAP	9 %

**Table 7 :** According to severity of sympts

Duration < 1 y	62 %
V.A.S < 5	62 %
(grade 4) Weakness	61 %
(. Wasting ( thenar m	16.8 %
DML < 6 mesc	16.8 %
L < 5.7 msec –SAP	18 %
Spont.act +ve	9 %

**Comparison of our 77 I.C.T.S cases with other studies :****Table1 :**According to sex , age, bilaterality and occupation

	Our study	<sup>23</sup> Phalens	<sup>8</sup> Philip L.H	<sup>9</sup> Bendles
sex	female % 94	female % 67	Female : male 10-2            1	
Age	y 60 -23	y 87 -20	y 50 – 30	%33
Bilateral	% 43	-----	% 33	clinically %33 EMG % 61
Occupation				
House wife	% 76	% 50		
Teacher	% 9.2	% 2		
Clerk	% 5.5	% 3.6		

Labourer	% 5.5	% 5.9		
Farmer	% 1.9	% 0.9		
Others	.....	% 40		

**Table 2:** comparing signs and sympts:

	Our study	<sup>23</sup> Phalens	<sup>24</sup> Richard	<sup>10</sup> Gellman	<sup>11</sup> Golding
Phalen's test	%74	% 80 -%74	% 66	%71	%77
Tinel's test	%80.5	%73	%74	%44	%66
Loss of sens	----	%92	-----	-----	-----
Hypoesthesia	%46.8	%79	-----	-----	%72
Hyperesthseia	%14.2	%4.6	-----	-----	-----
Paresthesia	-----	% 6	-----	-----	-----
Wasting	% 7	%41	% 36	-----	-----
weakness	%62.3	-----	%44	-----	-----

**Table 3:** comparing electro –phys.abn.

	Our study	<sup>14</sup> Ani -F.AI	<sup>12</sup> Kelly	<sup>28</sup> Titey	<sup>24</sup> Richard	<sup>26</sup> Kopell	<sup>19</sup> Gelhmen
.Spont act	% 9	%16.3	% 50	%46	% 48	% 40	---
DML< 6 msec	% 16.8	-----	-----	% 16	----	-----	----
SAP< 5.7 msec	% 18	-----	-----	-----	% 16	-----	-----
Abn.DML	%79	%76.7	% 70	----	% 2	%84	%94
Abn.SAP	%91	%86	-----	%85	% 90	%95	%88

### Discussion and Conclusion:-

In our 77 I.C.T.S hands we noticed :

Most of them were middle age females (house – wives ) using their hands excessively (this goes with the effect of heavy manual work as a cause of (I.C.T.S) ).<sup>21,22</sup>

According to sympts : numbness was the main presenting sympt in all pts., Followed by tightness , soreness , tingling and puffiness of the hand .Burning sens.44% was much higher than coldness 15.6% . Nocturnal worsening was found in 84.4 % of pts. Clumsiness was noticed in < 50% of pts ( 66 % ) and proximal referral showed a high % ( 80.5 %). A +ve phalen test found in 74 % which was comparable to other studies while +ve Tinel's test ( 80 % ) was higher than them , 61% of pts. reported sensory changes in the form of hypo or hyperalgesia and we noticed that there were more pts with hyperesthesia in our study than in Phalens<sup>23</sup> .

Less wasting was noticed in our pts inspite of long duration of disease and severe compression of the n ,but high % of weakness ( Grade IV)was reported<sup>10,11,23,24</sup> Spont .act.was low in our pts , when compared to others while

Dr.F.AIAni in his study in Iraq at 1989 put a % of 16.3%<sup>14</sup> which is very near to ours Johnson reported spont .act.as very rare<sup>12</sup> DML and SAP abnormalities were recoded in 79 % and 91% respectively and were comparable to other studies<sup>10,12,14,24,26,28</sup>

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