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RESEARCH ARTICLE

ASSESSMENT OF BLOOD GROUPS AND DACTYLOGLYPHIC PATTERN AMONG TRIBAL BELT PHYSIOTHERAPY COLLEGE STUDENT IN CHHATTISGARH.

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Abstract

Background: The dactylographic pattern appear for the first time on the human fingers, palm, soles and toes, this ridges that formed during the fetal period do not change their course, pattern or alignment throughout the life of an individual, until destroyed by decomposition of the skin after death, ABO and Rh blood group system are of major important part of human being. All students are good health and we excluded all students that suffered any physical deformities due to any injury, permanent scars on any fingers and any blood group disease.

Aim: To determine the blood groups and the pattern of dactylographic of both hands.

Materials and Methods: This research was conducted 400 students, 109 male and 291female, 17 and 27 years, in tribal belt Government Physiotherapy College in Chhattisgarh, India. We include student was healthy and excluded all students that having hand or finger any physical deformities due to any injury, permanent scars on any fingers and blood group disease.

Result: In current research tribal students, 109 (27.25%) were male and 291 (72.75%) were female, maximum no 221 (55.25%) was in "O" blood group, minimum students was in "AB" blood group 26 (6.50%),) total no of dactylographic pattern in female 2910 (72.75%) and male 1090 (27.25%), maximum no. dactylographic pattern was whorl 2200 (55%), minimum no of pattern was composite 60 (1.50%).

Conclusion: In this research we found total no of Rh - positive 3710 (92.75%), Rh - negative 290 (7.25%), dactylographic pattern was helpful in upcoming scientist, that handle medico-legal case, diagnosis of inheritable disease, forensic purpose.

Introduction:-

Physical evidence like as gender, age, color complexion, hair pattern, dactylographic, lip blot, bite impression, DNA profile, tattoo impression, scars mark, occupational pattern, clothes, and personal use articles were used for the purpose of identification[1, 2]. The word Dactylographic was taken from two Greek words, dacktylos, graphein meaning "finger to write"[3]. Dactylographic process to take the impression of papillary or friction ridges of the fingertips, for the purpose of identification of person[4].

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The dactylographic patterns were unique in each person that even identical twins originating from one fertilized egg, sharing the same DNA profile have distinct dactylographic patterns. Even once formed, they do not change their course or alignment throughout the life of an individual one[2]. They were present at birth, both on epidermis and dermis[5]. Dactylographic pattern appear first time from the 12th to 16th week of intrauterine life and their formation completed by 24th week of intrauterine life[6, 7]. The dactylographic ridges appear first on the fingers, then on the palm or sole[8]. In 1930, Nobel Prize for his discovery of blood group, ABO classified into 4 principal types: A, B, AB, O. There are two antigens and two antibodies responsible for ABO type. Rh blood group is one of the most complex blood groups in human and it is further classified into Rh-positive and Rh-negative due to the presence of absence of D antigen[9].

DNA analysis are sophisticated, expensive, time consuming, and not available especially in rural tribal areas and developing countries like India. Dactylographic pattern was one of the oldest, more reliable and mature biometric technologies and was considered one of the best, most cheapest and valid proofs of identification. This current research keen useful in tribal area for tribal students, all upcoming scientists. Forensic, Anatomist, Anthropologist.

Methods:-

This current research was conducted in tribal belt Government Physiotherapy College in Chhattisgarh, India. We obtained for this study 400 students, 109 male and 291female randomly. We make sure that all Students were belongs to Tribal area of Chhattisgarh, India and their age range between 17 and 27 years. The entire student was healthy and excluded all students that having hand or finger any physical deformities due to any injury, permanent scars on any fingers and blood group disease. We took permission and consent to all college and respected students. Dactylographic pattern were taken according to Cummins and Mildo in 1961, illustrated to INK method. This research we used is magnifying lens, A4 size white paper, orient sourcing blue color INK tube, roller, spread cardboard platform, gauze, pencil and pen. First student wash to their hands and dry with the help of napkin there after press right and left-hand individual fingertip separately in the stamp pad, 10 digits prints were taken in 10 separate column on a white A4 size paper, we obtained with the help of magnifying lens dactylographic patterns loops, whorls, and arches and other related blood group, age sex basic require detail data were collected.

Observation and Results:-

In current research we obtained out of 400 tribal students, 109 (27.25%) were male and 291 (72.75%) were female, 17 to 27 year students. We found (Table no -1) maximum student belongs to 221 (55.25%) “O” blood group than 114 (28.50%) “B” blood group followed to 39 (9.75%), minimum students was in 26 (6.50%) “AB” blood group. In male (109), maximum was 51 “O” blood groups and minimum was in 10 “AB” blood groups. In female (291) also maximum related to 170 “O” blood groups and minimum was in 16 “AB” blood groups.

We obtained (Table 2) more students was related 221 (55.25%) “O” blood groups and fewer students were in 26 (6.50%) “AB” blood groups, maximum Rh positive were 211 (95.47%), “O” positive, fewer in 24 “AB” positive and Rh negative were maximum in 10 “O” negative, fewer 2 “AB” negative.

We obtained (Table 3) total no of female 2910 (72.75%) and male 1090 (27.25%), maximum no. dactylographic pattern was whorl 2200 (55%), in male was 400 (18.18%), in female was 1800 981.18%) than loop 1120 (28%), in male was 220 (19.64%), in female was 900 (80.35%) followed arch 620 (15.50%), in male was 420 (67.74%), in female was 200 (32.25%) and less no of pattern was composite 60 (1.50%) in male was 50 (83.33%), in female was 10 (16.66%).

We obtained (Table 4) in thumb maximum no of dactylographic pattern was whorl 580 (26.35%), less no of pattern was composite 18 (30.00%), in index maximum no of dactylographic pattern was whorl 400 (18.18%), less no of pattern was composite 19 (8%), in middle maximum no of dactylographic pattern was whorl 480 (21.81%), less no of pattern was composite 19 (31.66%), in ring maximum no of dactylographic pattern was whorl 250 (11.36%), less no of pattern was composite 8 (13.33%), in little maximum no of dactylographic pattern was whorl 490 (22.01%), less no of pattern was composite 10 (16.00%).

We obtained (Table 5) total no of Rh - positive 3710 (92.75%), Rh - negative 290 (7.25%), in loop pattern related total Rh – positive was 1041 (92.94%), Rh – negative was 79 (7.05%), maximum no 436 (38.65%) was in “O” positive, minimum no 6 (0.53%) was in “AB” negative. Whorl pattern related total Rh – positive was 2038

(92.63%), Rh – negative was 162 (7.36%), maximum no 1148 (52.18%) was in "O" positive, minimum no 12 (0.54%) was in "AB" negative. Arch pattern related total Rh – positive was 593 (95.64%), Rh – negative was 27 (4.35%), maximum no 500 (80.64%) was in "O" positive, minimum no 2 (0.32%) was in "AB" negative. Composite pattern related total Rh – positive was 38 (63.33%), Rh – negative was 22 (36.66%), maximum no 26 (43.33%) was in "O" positive; not obtained any pattern in "A" and "AB" negative students.

Discussion:-

Cummins[10] found changes in dactylographic pattern due to heredity and accidental or environmental influence, which outcome stress and tension in their growth during fetal life, the skin covers by the anterior aspect of human hand and planter aspect of the human foot was different in the texture and appearance than the rest of the human body, the skin on the palmar and planter aspect was continuously changes in wrinkled with narrow minute ridges known as friction, ridges, dactylographic pattern was one of the oldest, reliable and mature biometric technologies, we always used this, one of the best, cheapest and valid proofs of identification, role of ridges to provide better firmer grip and to avoid slippage. Dactylographic pattern was an impression of the friction ridges on all parts, 1892 Sir Francis Galton first traced than published his work on dactylographic pattern by his cousin Charles Darwin, This research was latter on termed as Dermatoglyphics by Dr. Harold Cummins, even though the process of dactylographic pattern identification had already in use for several hundred years ago. Kshirsagar SV et al and Mahajan AA et al found the universal distribution of pattern of fingerprint was of the order in individual with "A", "B", "AB" and "O" blood group, higher frequency of loops, moderate of whorls and low of arches, the same finding was seen in Rh-positive and Rh-negative individuals[11,12].

Dr.Radhika.R.H[13] found Loop was most frequently seen dactylographic pattern in blood group "O" positive is most common blood group and "AB" negative is absent. Shivhare, et al.[14] found 38.46% of maximum to "O" blood group followed by "A", "B" and "AB" were 95.77%, Rh-positive and 4.23% Rh-negative. Loops higher in female, "B" blood group and Rh-positive, Whorls higher in male, "A" blood group and Rh-negative and arches higher male, "AB" blood group, Rh-positive and loops lowest male, "AB" blood group and Rh-negative, whorls lowest female, "B" blood group and Rh-positive and arches lowest female, "B" blood group, Rh-negative. Bharadwaj et al.[15] were found whorls highest in Rh-negative (43.63%) and lowest in Rh-positive (31%). Nayak SK et al[16] found in index is highest in blood group "AB" and lowest in "A", loops were maximum no and arches fewer. Mahajan[17] found the highest percentage of loops in "O" blood group, fewer in "B" and in whorls the highest percentage of "AB" blood group, fewer in "O". In arch the highest percentage "B" blood group, fewer in "AB". Kshirsagar et al[11] found that percentage of whorls was higher in blood group "O" and low in "AB", percentage of blood group "AB" was arches in high and low in "B". A. D. Patil et al[18] found high frequency in blood group "O" and low in "AB", ulnar loops and whorls in males. Desai et al[1] found that in their study that loops were dominating every blood group as well as Rh group, whorls high in "O" negative group, loops and arches were found in high frequency in Females, whorls in males, this connection found between sex and dactylographic pattern. U. N. Umaraniya et al[19] found in majority of students was blood group "O" and least was "AB", higher frequency of loops in blood group "A" and whorls in blood group "AB". Ekanem A.U. et al[20] found that majority of the subjects belonged to "O" group, blood group "O" was pre-dominantly associated to loops while least to "AB", loops and whorls were commonest among males while arches in females. Govindarajul et al[21] found that "O" is the most prevailing blood group and "AB" negative least, the dactylographic patterns were high frequency in loops, moderate amount of whorls and lowest was arches. Mehta and Mehta[22] found that loops were highest in blood group "O", whorls in "B" and arches in "AB", the total finger ridge count was highest in "B" blood group. In our current research we found highest frequency belongs to 221 (55.25%) "O" blood group than 114 (28.50%) "B" blood group followed to 39 (9.75%), least students was in 26 (6.50%) "AB" blood group, in male (109), majority was 51 "O" blood groups and least was in 10 "AB" blood groups, in female (291) also majority related to 170 "O" blood groups and least was in 16 "AB" blood groups, higher frequency Rh positive were 211 (95.47%), "O" positive, fewer in 24 "AB" positive and Rh negative were maximum in 10 "O" negative, fewer 2 "AB" negative, total no of female 2910 (72.75%) and male 1090 (27.25%), higher no. dactylographic pattern was whorl 2200 (55%), in male was 400 (18.18%), in female was 1800 981.18%) than loop 1120 (28%), in male was 220 (19.64%), in female was 900 (80.35%) followed arch 620 (15.50%), in male was 420 (67.74%), in female was 200 (32.25%) and least no of pattern was composite 60 (1.50%) in male was 50 (83.33%), in female was 10 (16.66%), thumb maximum no of dactylographic pattern was whorl 580 (26.35%), less no of pattern was composite 18 (30.00%), in index maximum no of dactylographic pattern was whorl 400 (18.18%), less no of pattern was composite 19 (8%), in middle maximum no of dactylographic pattern was whorl 480 (21.81%), less no of pattern was composite 19 (31.66%), in ring maximum no of dactylographic pattern was whorl 250 (11.36%), less no of pattern was composite 8 (13.33%), in little maximum no of dactylographic pattern

was whorl 490 (22.01%), less no of pattern was composite 10 (16.00%), total no of Rh - positive 3710 (92.75%), Rh - negative 290 (7.25%),higher frequency whorl pattern related total Rh – positive was 2038 (92.63%), Rh – negative was 162 (7.36%), least Composite pattern related total Rh – positive was 38 (63.33%), Rh – negative was 22 (36.66%), maximum no 26 (43.33%) was in "O" positive; not obtained any pattern in "A" and "AB" negative students. Our research differ to Dr.Radhika.R.H[13] and Shivhare, et al.[14] there higher in "O" blood group and more frequency in loop pattern, Nayak SK et al[16] highest "AB" and lowest in "A", loops were maximum no and arches fewer Mahajan[17] found the highest in loops in "O" blood group, fewer in "B" and in whorls the highest percentage of "AB" blood group, fewer in "O". Kshirsagar et al[11] and above other auther all was correlated to our research higher frequency in "O" blood group but differ in dactylographic pattern in our observation higher group was in whorl and rest researcher were obtained loop and arch.

Conclusion:-

This research was relation between dactylographic pattern, blood group and sex, majority of students belongs to Rh-positive and "O" blood group, whorl were the frequently and composite were least dactylographic pattern, whorl were highest in "O" blood group and lowest in "AB" blood group, whorl higher in female and in male, whorl were highest in Rh-positive and lowest in Rh-negative. Dactylographic pattern helpful in all new upcoming researcher scientists, it also helpful to catch out the victims and another person who touches the surface. Dactylographic pattern scans presently most popular, used in different routine work, it keen for digital mission of India, biometric; validate electronic registration, cashless, library access, and forensic investigator anatomist, anthropologist.

List of abbreviations:
None declared.

Competing interests:
We have no competing interests.

Author's contribution:
Dr. Rajni Thakur has made to conception, procedure, drafting the manuscript, data collection, tabulation, covert images in JPG file. Dr. Deepti Gautam has made collection of sample, revising manuscript, tabulation, arrange the image.

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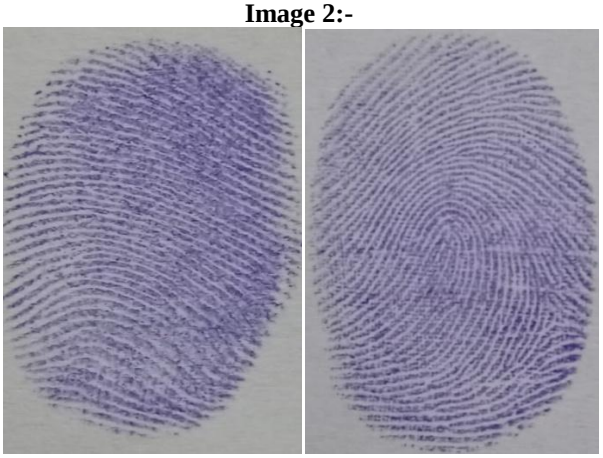
Image 1:-Require material for dactylographic pattern.

Image 2:-



(A) Arch **(B) Loop**

(C) Whorl **(D) Composite**

Table 1:-Students distributed according to Sex and Blood Groups.

BLOOD GROUP	MALE	FEMALE	TOTAL
A	14 (35.89%)	25 (64.10%)	39 (9.75%)
B	34 (29.82%)	80 (70.17%)	114 (28.50%)
AB	10 (38.46%)	16 (61.53%)	26 (6.50%)
O	51 (23.07%)	170 (76.92%)	221 (55.25%)
TOTAL	109 (27.25%)	291 (72.75%)	400 (100%)

Table 2:-Students distributed according to Blood Groups and Rh factors.

BLOOD GROUP	RH FACTOR		TOTAL
	RH +VE	RH- VE	
A	30 (76.92%)	9 (23.07%)	39 (9.75%)
B	106 (92.98%)	8 (7.01%)	114 (28.50%)
AB	24 (92.30%)	2 (7.6%)	26 (6.50%)
O	211 (95.47%)	10 (4.52%)	221 (55.25%)
TOTAL	371 (92.75%)	29 (7.25%)	400 (100%)

Table 3:-Students dactylographic pattern distributed according to integer of both hands and sex.

DACTYLOGRAPHIC PATTERN	MALE	FEMALE	TOTAL
LOOP	220 (19.64%)	900 (80.35%)	1120 (28%)

WHORL	400 (18.18%)	1800 (81.81%)	2200 (55%)
ARCH	420 (67.74%)	200 (32.25%)	620 (15.50%)
COMPOSITE	50 (83.33%)	10 (16.66%)	60 (1.50%)
TOTAL	1090 (27.25%)	2910 (72.75%)	4000 (100%)

Table 4:-Students dactylographic pattern

DACTYLOGRAPHIC PATTERN	THUMB	INDEX FINGER	MIDDLE FINGER	RING FINGER	LITTLE FINGER	TOTAL (4000)
LOOP	350 (31.25%)	220 (19.64%)	210 (18.75%)	200 (17.85%)	140 (12.50%)	1120 (28%)
WHORL	580 (26.36%)	400 (18.18%)	480 (21.81%)	250 (11.36%)	490 (22.27%)	2200 (55%)
ARCH	150 (24.19%)	20 (3.22%)	190 (30.64%)	60 (9.67%)	200 (32.25%)	620 (15.50%)
COMPOSITE	18 (30.00%)	8 (13.33%)	19 (31.66%)	8 (13.33%)	10 (16.00%)	60 (1.50%)

Table 5:- Dactylographic patterns distributed according to Right and Left hand integer (4000) in 400 students to ABO and Rh Blood Group.

DACTYLO GRAPIC PATTERN	BLOOD GROUP "A"		BLOOD GROUP "B"		BLOOD GROUP "AB"		BLOOD GROUP "O"		Rh - positive (TOTAL)	Rh - negative (TOTAL)	TOTAL
	Rh + ve	Rh -ve	Rh +ve	Rh - ve	Rh + ve	Rh _ ve	Rh + ve	Rh - ve			
LOOP	150 (13.29%)	25 (2.21%)	400 (35.46%)	20 (1.77%)	55 (4.87%)	6 (0.53%)	436 (38.65%)	28 (2.48%)	1041 (92.94%)	79 (7.05%)	1120 (28%)
WHORL	120 (5.45%)	60 (2.72%)	600 (27.27%)	55 (2.5%)	170 (7.72%)	12 (0.54%)	1148 (52.18%)	35 (1.59%)	2038 (92.63%)	162 (7.36%)	2200 (55%)
ARCH	25 (4.03%)	5 (0.80%)	55 (8.87%)	4 (0.64%)	13 (2.09%)	2 (0.32%)	500 (80.64%)	16 (2.58%)	593 (95.64%)	27 (4.35%)	620 (15.50%)
COMPOSITE	5 (8.33%)	nil	5 (8.33%)	1(1.66%)	2 (3.33%)	nil	26 (43.33%)	21 (35%)	38 (63.33%)	22 (36.66%)	60 (1.50%)
TOTAL	300 (7.50%)	90 (2.25%)	1060 (26.50%)	80 (2%)	240 (6%)	20 (0.5%)	2110 (52.75%)	100 (2.5%)	3710 (92.75%)	290 (7.25%)	4000 (100%)

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