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RESEARCH PAPER

THE INCIDENCE AND PATTERN OF SUPERNUMERARY DIGITAL FLEXION CREASES AMONGST THE POPULATION OF EKPOMA IN EDO, NIGERIA

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ABSTRACT

This study on the incidence of supernumerary digital flexion crease was carried out among undergraduate students in the faculty of Basic Medical Sciences, College of Medicine, Ambrose Alli University, Ekpoma, Edo State, Nigeria. 434 palms from 217 students (mean age 21.93 ± 2.15 years) were examined. 134 (61.75%) were males, while 83 (38.28%) were females. The results showed that 18 (1 in 12; 8.34%) subjects presented supernumerary digital flexion crease in at least one finger on either left or right palm. The observed incidence was also, more prevalent among the males than the females (ratio 5:3); on the left (24.23%) than the right palm (18.89%); and on the ring finger (77.7%) for left palm, but on the middle and index fingers (33.33% each) for right palm. Thus the reported incidence of supernumerary flexion creases calls for further research considering its association with clinical syndromes/anomalies.

Keywords: Supernumerary, Digital flexion crease, Palmar-skin, Clinical syndromes.

INTRODUCTION

Except for the thumb which has two phalanges -the proximal and distal phalanx, the other four digits of the hand have three phalanges respectively that is, the proximal, middle and distal phalanx (Moore, et al. 2006). These phalanges are known to articulate with each other at joints termed interphalangeal joints. These associated joints are characterized by recognizable digital flexion creases representing locations of firmer digital palmar-skin attachment to the underlying structures. According to Moore, et al. (2006) and Singh et al. (2002), it also corresponds to the regions of the palm where accelerated growth does not take place.

However, earlier studies have described abnormalities in the digital flexion creases in a number of syndromes. For example, a reduced number of digital flexion creases per digit has been reported in several disorders such as fetal alcohol syndrome, down syndrome, and trisomy 18 (Jones and Smith, 1973; Plato et al., 1973; Hodes et al., 1978). On the other hand, incidences of increased number of digital flexion creases per digit otherwise termed "supernumerary digital creases", have been described in partial deletions of chromosome, partial trisomy, cerebro-oculo-facio-skeletal syndrome and in sickle cell disease (Zizmor, 1973; Raoul et al., 1975; Schinzel et al., 1976; Watson et al., 1986). In addition, both reduced and "supernumerary" digital flexion creases have been reported in individuals with Larsen syndrome (Latta et al., 1971; Dallapiccola and Capra, 1973).

Although digital flexion creases arise independent of fetal palmar movement, they seem to be more consistent with their temporal appearance during gestation and their alterations in their normal pattern are associated with specific syndromes and exposures (Stevens et al., 1988). It has also been reported that the presence of extra and missing digital creases in several syndromes suggests a genetic link (Stevens et al., 1988; Kameth et al., 2002) and genetic analysis have revealed that 75% of individuals with supernumerary digital creases had mutations in Alagille Syndrome, which involves in the disease gene called JAG1 (Li et al., 1997; Krantz et al., 1998), while 83% of individuals without supernumerary creases were mutation-positive (Krantz et al., 1998).

Available literature indicate that supernumerary digital flexion creases have been found almost always, occurring unilaterally, bilaterally and on anywhere from 1 to all 10 digits but not exclusively, in the middle phalanges (between the proximal and distal interphalangeal joints) (Kameth et al., 2002). It has also been shown that less than 1% of the general population have the 5th-finger type of supernumerary digital flexion creases, while 7-11% of a control population have distal interphalangeal supernumerary flexion crease (Komatz et al., 1978).

Considering the clinical syndromes associated with supernumerary digital flexion crease, it becomes reasonable to conduct this preliminary study in a population such as ours, where there is comparatively, no regard for the clinical relevance/associated consequence of supernumerary digital flexion creases. Specifically, this study investigates the incidence of supernumerary digital flexion crease amongst the undergraduate population of the College of Medicine, Ambrose University, Ekpoma, Edo State, Nigeria, based on the obvious diverse ethnic backgrounds.

MATERIALS AND METHODS

Study design: This study adopted the descriptive cross sectional survey method.

Study Area: Ekpoma, the study area, is the administrative headquarters of Esan West Local Government Area of Edo State, Nigeria. It area lies between latitudes 6° 43' and 6° 45' North of the Equator and longitudes 6° 6' and 6° 8' East of the Greenwich Meridian (Aziegbé, 2006).

Study population: The study was conducted in the Faculty of Basic Medical Science, College of Medicine, Ambrose Alli University Ekpoma, Edo State, Nigeria. The undergraduate students of the Departments of Medicine and Surgery, Medical Laboratory Science, Nursing, and Physiology, formed the study population.

Ethical Consideration: Informed consent was sought for and was granted by all the students involved in the study. They quite understood the bases of the study following detailed explanations and series of lectures on the subject.

Exclusion Criteria: Students, who choose not to participate or have injured palms, were excluded.

Data Collection: Data was collected by well trained research assistants from Anthonio Research Centre Ekpoma, Edo State, Nigeria, on one on one basis with the students. The parameters required such as age, sex and pattern of digital flexion palmer crease on both palms, were thoroughly examined and documented as appropriate. A suitably designed data form was used for this purpose. The digital creases were examined based on the description by Moore et al. (2002). With a digital camera also, pictures were taken in cases where supernumerary digital flexion creases was observed.

Data Analysis: Data was analyzed using the Statistical Package for Social Sciences (SPSS; version 17) and the simple descriptive statistic was performed. Chi square and t- test $p=0.05$ was used also to check for significance at $P \leq 0.05$.

RESULTS

Table 1 shows the characteristics and incidence of supernumerary digital flexion crease (SNDFC) amongst the study population. The mean age of the participants was 21.93 ± 2.15 years. Majority of study population were males (134; 61.75%) against 83 (38.25%) females. Supernumerary digital flexion crease was observed in 18 subjects (8.30%).

Table 2 shows the distribution of supernumerary digital flexion creases by sex. Amongst the 18 subjects who presented supernumerary digital flexion creases, 15 were males while 3 were females.

Table 1: Participant profile and incidence of supernumerary digital flexion crease

Profile	Mean + Standard Deviation	
Age	21.93 ± 2.15	
Sex	Number	%
Male	134	61.75
Female	83	38.25
Incidence of SNDFC	Number	%
Absent	199	91.71
Present	18	8.30

Table 2: Sex distribution of supernumerary Digital Flexion Crease (SNDFC) Variation

Sex	Absent	Present	Total
Male	119	15	134
Female	80	3	83
Total	199	18	217

Table 3: Distribution Pattern of supernumerary digital flexion crease on the left and right palms based on anatomical position

Sub	SNDFC on Left Palm					SNDFC On Right Palm				
	Thu	Ind	Mid	Annu	Min	Min	Anu	Mid	Ind	Thu
1	-	-	+	+	-	-	-	+	+	-
2	-	-	-	+	-	-	-	-	-	-
3	-	+	+	+	-	-	+	+	+	-
4	-	+	+	+	-	-	+	+	+	-
5	-	-	-	+	-	-	-	-	-	-
6	-	+	+	+	+	-	+	+	-	-
7	-	+	-	-	-	-	-	-	-	-
8	-	+	+	+	-	-	+	+	+	-
9	+	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	+	+	+	-	-	-	-	-	-
12	-	-	+	+	-	-	-	-	+	-
13	-	+	+	+	-	-	-	-	-	-
14	-	+	-	-	-	-	-	-	-	-
15	-	+	+	+	-	-	-	-	-	-
16	-	-	-	+	-	-	-	-	-	-
17	-	-	-	+	+	-	-	-	-	-
18	-	+	+	+	+	-	+	+	+	-
Total	1	10	10	14	3	0	5	6	6	0
% on digits	5.56	55.56	55.56	77.78	16.67	0	27.78	33.33	33.33	0
% on Palm	42.23					18.89				

Key: Sub = Subjects; % = Percentage; Thu = thumb; Ind = Index finger; Mid = Middle finger; Annu = Annularis (Ring finger); Min = Minimus (small finger).

Table 3 shows the incidence pattern of supernumerary digital flexion crease. It was observed that supernumerary digital flexion creases were more prevalent on the left palm (42.23%) particularly on the annularis (77.78%). On the right palm however, the index (33.33%) and middle (33.33%) fingers, were equally and predominantly affected.

Figures 1, 2, 3, 4, 5, 6 and 7 represent pictures summarizing the various variations of supernumerary digital flexion crease presented by the subjects. The arrows indicate the affected fingers.



Fig. 1: Right palm showing supernumerary digital flexion crease on the index, middle and annularis fingers



Fig. 2: Left palm showing supernumerary digital flexion crease on the index, middle and annularis fingers



Fig. 3: Left and right palm showing supernumerary digital flexion crease presented on different fingers of the palm



Fig. 4: showing supernumerary digital flexion crease on the middle and annularis fingers of the left palm



Fig. 5: Right palm showing supernumerary digital flexion crease of different pattern on the index, middle and annularis fingers.



Fig. 6: Left palm showing supernumerary digital flexion crease on the annularis finger only

DISCUSSION

The findings from this study further substantiate the incidence of supernumerary digital flexion creases (SNDFC) amongst populations and that the prevalence rates may vary among different populations. However, Schaumann and Kimura (1991) stated that the knowledge on crease patterns as well as their value is yet incomplete and that the gaps

in our insight limit the possible interpretations. This applies also, to the need for a practical application of all knowledge gained from related studies.

Nevertheless, the observed incidence of SNDFC in this study, was rather not restricted to any particular finger as reported by Dejong and Platou (1967), Zizmor (1973) and Komatz et al. (1978) but similar to that of Kosztolanyi and Meyes (2003) who reported a 'multi-digital' incidence of SNDFC. In fact, the incident pattern suggests the rareness of SNDFC on the thumb as it recorded the least incident value on the left with none on the right.

Of particular interest is the observed variation in the incidence pattern of SNDFC amongst the studied population. This was rather an expected outcome as Jaja et al. (2008) insists that variations in the distribution of dermal ridge pattern-types across the fingers form part of dermatoglyphic studies. They added that the tendency for homologous fingers to have comparable counts of pattern-types in healthy people and for left hand digits to have a slightly higher count of arches as compared to right hand digits in both sexes have been demonstrated.

It is worthy to note however, that though SNDFC has been associated with some clinical syndromes, the academic career of these student under study -being medical college students, seem not to have suffered any untoward consequences; considering their present academic levels as they were all apparently healthy. This line of thought is based upon the claims that individuals with SNDFC have associated clinical syndromes e.g. Allagile syndrome -a complex dominantly inherited multisystem disorder involving the liver, heart, eyes, faces, skeleton, and other systems (Kameth, 2002). One can imagine therefore, how the students would have grappled with the stated conditions, had it been that the observed incidence of SNDC was associated with debilitating conditions. Nevertheless, it is our opinion that further research remains absolutely necessary.

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AUTHORS' CONTRIBUTIONS

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