

The Incidence of Agenesis of Palmaris Longus Muscle and the Frequency of Left-Handedness among Adult Ijaws in Bayelsa Nigeria

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Abstract: This study was carried out to determine the incidence of agenesis of Palmaris longus muscle and the frequency of left handed individuals among the Ijaw ethnic group in Bayelsa State in Nigeria. A check on the incidence of agenesis was carried out on adult males and females on both hands by inspection. The flexor tendon was made prominent by flexing thumb and placing it on the little finger. The check on frequency of left handedness was done by noting the hand the subjects use to write. Results showed that the overall incidence was found to be 1.6 (16 in 1000 subjects). The incidence was on both hands (right and left). The result from the second study shows that 7.6% (76 in 1000 subjects) of Ijaws in Bayelsa state are left handed. The incidence of agenesis of Palmaris longus muscle occurs more in the left hand than the right hand and more prevalent among the occidentals than the Orientals. It was also observed that the frequency of left handedness among the Ijaws was minimal.

Key words: Agenesis • Palmaris Longus • Frequency • Handedness • Adults • Ijaws

INTRODUCTION

The Palmaris longus muscle is situated on the anterior aspect of the forearm. Its nature varies in individuals and previous studies have revealed that this muscle is absent in about 13% of subjects examined [1]. It is variable in its attachment, morphology, duplication and has an accessory slips [2-4]. Previous comparative anatomical study revealed that this muscle is present in all mammals [5]. The muscle is best developed in mammals in relation to function [3]. This muscle is related to flexor carpi radialis and flexor carpi ulnaris (lying between them) and overlaps the flexor digitorum superficialis [4, 6]. It originates from the common flexor tendon and inserted to the palmar aponeurosis. The muscle is clinically important because its tendon overlaps the median nerve from the lateral aspect and may be mistaken for the nerve.

In Uganda [4] studied this muscle in 1600 subjects and record its incidence of agenesis to be 1.02% with only one unilateral agenesis in the studied group. In another study [2] recorded incidence of 12.8% in adult males and females in white and black Americans in the ratios of 10:1 and 7:1 respectively. A report by Grubar [7] showed an incidence of 20.4% in Germans. According to Adachi

[8] and Nakator [9] the incidence was reported to be 3.4% in Japanese and 2.2% in Chinese respectively. These studies revealed that the agenesis of the Palmaris muscle is more common in the occidentals than in the orientals and black races. Records of sex and racial differences from a research indicated the incidence of agenesis as lower in Negroes than whites and lower in males than females in both races [10, 11]. Incidence of Palmaris muscle in Edo State was found to be 1.3% [12]. A three headed reversed Palmaris longus muscle in a 36 years old woman was reported [13, 14], theory of left handedness proposes that right handed children have developed normally and they exhibit leftward symmetries in language areas. In contrast, left handed children have suffered complications which have led to anomalous cerebral dominance and motor co-ordination shift to the left side in these children [14]. The theory holds that agenesis is a minor factor in the determination of left handedness. According to GBG theory, the chemical variation and its effect account for the followings:

Left handedness is more common in men than women [15]. Language disorders are more prevalent in men than women [16]. Left handedness is linked with developmental disorders of childhood [17-19]. Immune

disorders and other diseases are more in the left handed individuals [14]. Plano was the first documented person to come up with an explanation why people are either right handed or left handed. His suggestion is that mothers and nurses carry children in their left arm so they could use their right hand for other task. The child therefore clings to the mother with right hand and develops the child's left hand ability by exploring his/her surroundings. This theory has no credibility because if correct, the proportion of lefties and right handed children would switch in each generation.

Some scientists believed that handedness is genetic. This theory says that left handedness is a recessive gene and right handedness is dominant. This explains the frequency of occurrence of left handedness in a family where there is a back ground of left handedness. A study carried out showed that chances of two right handed parents having a left hander child is 2%, one parent left handed is 17% and both parents lefty is 47% [18].

Much study has been done concerning the incidence of agenesis of Palmaris longus muscle and the frequency of left handedness in other parts of the globe including Nigeria. Therefore the purpose of this study was to determine the incidence of Palmaris longus muscle agenesis and the frequency of left handedness in Ijaw ethnic group in Bayelsa State-Nigeria.

MATERIALS AND METHODS

A total of 1000 adult subjects, 547 males and 453 females from the four Ijaw speaking Local Government Areas of Bayelsa State were used for this study. From each individual, a recording was made of agenesis

(absence) of Palmaris longus muscle by inspection of the flexor tendons at the wrist joint of both arms. The flexor tendon was made visible by asking the individual to flex the hand at the wrist joint and placing the thumb on the little finger. The hand the subject use to write was also noted to know the frequency of left handed individuals.

The check of incidence of agenesis was done on adults of both sexes [10, 12]. The physical examination was made precise with the knowledge that Palmaris longus muscle has its common tendon of origin from the medial epicondyle and ligament. The superficial layers of the four flexor muscles can be traced as they go to their insertion. Pronator teres muscle goes to the radius half way along its lateral aspect at its greatest convexity. The flexor carpi radialis crosses the distal skin crease of the radius in front of the tubercle of the scaphoid while the Palmaris longus goes to its area of adherence in front of the flexor retinaculum which tendons can be seen at the wrist.

RESULTS

The results show that seven subjects had agenesis of the Palmaris longus muscle on the right (7 in 1000 individuals) hand while nine (9 in 1000 individuals) had it on the left hand as shown in Table 2 and fig. 1 below. From the study, the percentage incidence of agenesis of Palmaris longus muscle in 1000 Ijaw subjects is 1.6%. There was one male who had bilateral incidence (right and left sides).

The result also shows the percentage frequency of left-handed individuals to be 7.6% (76 out of 1000) as shown in Tables 3 and 4 and fig. 2

Table 1: Showing Local Government Areas, Total Sample Size and Sex Size Used for the Study

| Local Government Areas | Sample Size | Males | Females |
|------------------------|-------------|-------|---------|
| Southern Ijaw | 250 | 160 | 90 |
| Ekeremo | 250 | 137 | 113 |
| Kolokomo | 250 | 100 | 150 |
| Sagbama | 250 | 150 | 100 |
| Total | 1000 | 547 | 453 |

Table 2: Showing Sex and Sides of the Body of Agenesis of Palmaris Longus Muscle.

| Local Govt. Area | No of People Count | Male | Female | Sides of the body and occurrence of agenesis | |
|-------------------|--------------------|------|--------|--|------|
| | | | | Right | Left |
| Southern Ijaw | 250 | 160 | 90 | 3 | 4 |
| Ekeremo | 250 | 137 | 113 | 2 | 2 |
| Kolokumo- Opokumo | 250 | 100 | 150 | 2 | 2 |
| Sabgama | 250 | 150 | 100 | Nil | 1 |
| Total | 1000 | 547 | 453 | 7 | 9 |

Table 3: Showing frequency of male and female left handed Individuals in the four L.G.A

| Parameters | Southern Ijaw | | Ekeremo | | KolokomoOpokumo | | Sagbama | |
|------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|
| | M _L | F _L | M _L | F _L | M _L | F _L | M _L | F _L |
| SEX | M _L | F _L | M _L | F _L | M _L | F _L | M _L | F _L |
| Incidence | 15 | 5 | 16 | 9 | 12 | 2 | 0 | 9 |
| Average | 10 | | 12.5 | | 7 | | 4.5 | |

CODES M_L = Male left handedness, F_L = Female left handedness

Table 4: Showing Frequency of Left Handed Males and Females AmongAdultIjaws in Bayelsa State.

| Parameters | SouthernIjaw | | Ekeremo | | Kolokumo/ Opokumo | | Sagbama | |
|--------------------------------------|----------------|----------------|----------------|----------------|-------------------|----------------|----------------|----------------|
| | M _L | F _L | M _L | F _L | M _L | F _L | M _L | F _L |
| Sex | M _L | F _L | M _L | F _L | M _L | F _L | M _L | F _L |
| Frequency | 20 | 4 | 17 | 8 | 13 | 4 | 1 | 9 |
| Total Left HandedIndividuals | 24 | | 25 | | 17 | | 10 | |
| Percentage of Left HandedIndividuals | 9.6% | | 10.0% | | 6.8% | | 4.0% | |

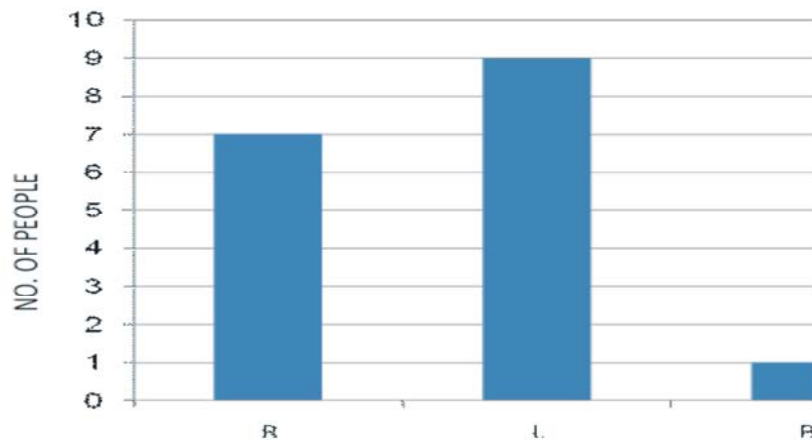


Fig 1: Bar Chart Showing the Incidence of Agenesis of Palmaris Longus Muscle Among Ijaws in Bayelsa State

R = right agenesi of palmarislongus muscle

L = left agenesi of palmarislongus muscle

B = bilateral agenesi of palmarislongus

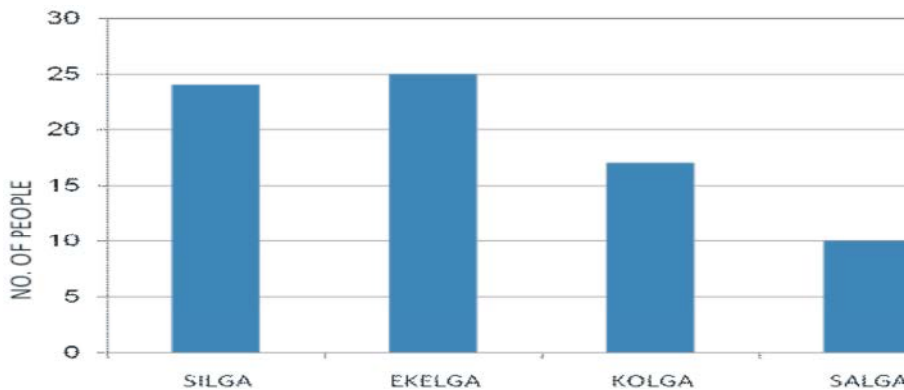


Fig 2: Bar Chart Showing the Frequency of Left Handed Individuals Among Adults Ijaws in Bayelsa State in the Four L.G.A.

SILGA = South Ijaw Local Government Area

EKELGA= EkeremoLocal Government Area

KOLGA = KolokumoOpokuma Local Government Area

SALGA = Sabgama Local Government Area.

DISCUSSION

An incidence of agenesis of Palmaris longus muscle and frequency of left handedness in one thousand Ijaw speaking adult males and females of the four local government areas of Bayelsa State were determined. It was observed that 1.6% (16 in 1000) of the study population had agenesis of Palmaris longus muscle. An incidence of 0.7% (7 in 1000 subjects) was recorded on the right side while 0.9% (9 in 1000 subjects) on the left side in both sexes. From our study, the assertion that agenesis of the Palmaris longus muscle is much more common in the occidental than oriental race is ascertained. Comparing the 3.4% occurrence in Japanese and 2.2% in Chinese from previous studies [8,9] and 20.4% in Negroes by [7] which is greater than that of Uganda's 1.02% with incidence of 1.22% of the left arm and 0.82% on the right. These values are similar to the ones obtained in Edo State Nigeria [12].

Occurrence of other variations apart from complete agenesis of the muscle for example, the presence of accessory slips had been suggested to be due to physical activity engaged in by a person. There was also a reported case of three headed reserved Palmaris longus muscle in a 36 years old woman [13]. The physical activity engaged in by the patient was believed to have led to muscle hypertrophy that caused slight compression over a segment of the left median nerve just proximal to the carpal tunnel. Aliye [20] have also examined the relationship between Palmaris longus muscle and reaction time, concluded that the presence of this muscle gives a noticeable advantage in sport.

From the second study, it was observed that the frequency of left handed individuals is seventy six out of one thousand which constitute a percentage of 7.6%. This is at variance with the work of Oremosu *et al.*, [21] who recorded a 22.4% male and 18.8% female prevalence respectively. It is certain that the high incidence of right handedness has shaped human society in almost every conceivable aspect. Tools, machineries and even clothing's are largely designed for the right handed. During this study many left handed individuals were strongly encouraged to switch to right hand. Some cultures associate left handedness with evil or bring bad luck especially among the Ijaws. Practically speaking, to back up the medical literature report, it was observed that lefties are more accident prone and are more likely to have their fingers amputated by power tools, suffer more wrist fractures. Lefties are more susceptible to allergies, autoimmune disease, bed wetting, depression,

drug abuse, epilepsy, hypnotism, low birth weight, schizophrenia, sleeping disorders, suicide attempts and certain learning disabilities. It was observed that lefties are six times likely to die in an accident and four times likely to die while driving. It was discovered that most lefties are homosexuals. It was also observed that twins are notorious for having birth difficulties and a high rate of left handedness too.

CONCLUSION

In conclusion Uganda as well as other Sub-Saharan Africans like Nigerians tend to show a lower incidence of agenesis of the Palmaris longus muscle but the suggestion and recommendation still remains that this study should be carried out among other sub-saharan Africans to break up the earlier observations made. The Ijaws in Bayelsa State has low frequency of Left handedness.

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