

Dermatoglyphic Patterns in Children with Chronic Constipation

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Analysis of the fine ridge configurations on the digits of the palms and soles (dermatoglyphics) may sometimes help in the diagnoses of certain medical disorders. Dermatoglyphic patterns have been reported to be associated with congenital anomalies, such as congenital heart disease, duodenal ulcer, abdominal pain, and constipation. The palmar dermatoglyphic patterns of 77 children with constipation (39 functional and 38 organic constipation) were recorded. The control group consisted of 84 children with inguinal hernia. Those patients with at least one arch identified on any digit of either hand were termed arch positive. There was no significant correlation between arch positivity and constipation (functional or organic), or inguinal hernia (chi square, $P = 0.9211$). Therefore, the presence of palmar arches cannot be used as a screening device for children with chronic constipation, especially of organic etiology.

KEY WORDS: fingerprints; constipation; abdominal pain; dermatoglyphics.

Dermatoglyphic patterns, an analysis of the fine ridge configurations on the digits of the palms and soles, theoretically could be used in the diagnostic evaluation of certain medical disorders, since formation of these patterns is under genetic influence (1, 2). Since Galton (3) first systematically studied fingerprints and identified the fundamental formations (arches, loops and whorls), it has been established that certain dermatoglyphic patterns are associated with a number of congenital anomalies (4-9).

A recent report has documented that a specific fingerprint pattern (arches) is seen in association with constipation and abdominal pain. These authors claimed that the fingerprint pattern was useful in distinguishing between functional constipation and constipation secondary to various organic disorders

(10). Since we treat a large number of children with constipation (11), we decided to analyze the dermatoglyphic patterns in these patients in an attempt to confirm or refute the above reported association (arches).

MATERIALS AND METHODS

The palmar dermatoglyphic patterns of 161 children with a primary diagnosis of either inguinal hernia ($N = 84$, controls) or constipation (functional, $N = 39$; organic, $N = 38$), seen in the pediatric surgery clinic, were examined. Each digit print was recorded as either an arch, whorl, or ulnar or radial loop (12). Each patient's fingers were examined with a hand-held magnifying glass and permanent records were obtained by using either a standard photocopying machine or the 3M Identifier System (St. Paul, Minnesota), an inkless fingerprint system.

Following each patient's clinic visit, his/her hospital record was reviewed for the following information: previous medical history, sex, and age. Patients were divided into the following groups: functional constipation ($N = 39$), organic constipation ($N = 38$),

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DERMATOGLYPHICS AND CONSTIPATION

TABLE 1. DISTRIBUTION OF ARCHES IN PATIENTS WITH INGUINAL HERNIA AND ORGANIC OR FUNCTIONAL CONSTIPATION*

	Arch positive	
	Yes (N, %)	No (N, %)
Inguinal hernia (N = 84)	25 (29.8)	59 (70.2)
Chronic constipation	Yes (n, %)	No (n, %)
Functional (N = 39)	13 (33.3)	26 (66.7)
Organic (N = 38)	Yes (n, %)	No (n, %)
	12 (31.6)	26 (68.4)

*Chi square, 2-3 contingency table; $P = 0.9211$.

[secondary to Hirschprung's Disease ($N = 17$), imperforate anus ($N = 15$) and other intestinal malformations ($N = 6$)] and inguinal hernia ($N = 84$). Constipation was defined as a bowel frequency of less than once every two days with associated fecal incontinence for a period of no less than three months. All patients with constipation were referred to the pediatric surgical service following failed treatment by their referring physicians. Patients with inguinal hernia had a negative history of constipation determined by hospital record review.

Children were further subdivided into arch positive, ie, those having at least one arch identified on any digit of either hand, and arch negative, ie, those having any combination of loops and/or whorls on all 10 digits.

Informed consent was obtained from the parents in accordance with the standards established by the Human Use Committee prior to data collection.

Statistical analysis was performed on the Michigan Interactive Data Analysis System (MIDAS), using analysis of variance and chi-square contingency table analysis with $P < 0.05$ considered significant.

RESULTS

There was no statistically significant correlation between arch positivity and functional constipation, organic constipation, and inguinal hernia ($P = 0.9211$) (Table 1).

There were no significant differences in mean age between the three study groups ($P = 0.1822$). Additionally, no significant correlation between arch positivity and sex was evident ($P = 0.1607$) (Table 2).

DISCUSSION

Numerous studies have attempted to correlate dermatoglyphic patterns with various medical conditions, both congenital (1, 4-6) and acquired (7, 13, 14) in origin. The rationale behind such inquiry is obvious: a

TABLE 2. AGE AND SEX IN PATIENTS WITH INGUINAL HERNIA AND ORGANIC OR FUNCTIONAL CONSTIPATION

Group	Age (mean \pm SD)	
Inguinal hernia (N = 84)	9.3 \pm 5.3	
Functional constipation (N = 39)	9.8 \pm 4.7	
Organic constipation (N = 38)	11.2 \pm 5.3	
ANOVA, P value = 0.1822		
	Arch Positive	
Sex	Yes (n, %)	No (n, %)
Males (109)	30 (27.5)	79 (72.5)
Females (52)	20 (38.5)	32 (61.5)
Chi square, 2-2 contingency table; $P = 0.1607$		

quick, noninvasive method with which to screen patients suspected of having some predisposition to a variety of diseases. However, in spite of the fact that several papers have been published demonstrating a correlation between dermatoglyphic patterns and specific medical conditions, including sexual dimorphism (15, 16), the practical application of dermatoglyphics to medical diagnosis has not occurred. This is probably due, in large part, to skepticism by the medical community, a lack of well-controlled confirmatory studies, and the fact that several investigators defined a large number of medical conditions that could be categorized by dermatoglyphic patterns, thus ensuring nonspecificity. Follow-up studies to confirm the association of dermatoglyphic patterns with such disorders as duodenal ulcer (7), rubella (8), fetal wastage (17), pseudohypoparathyroidism (4), and congenital heart disease (9) have been rare. However, a study of dermatoglyphics and leukemia (18) failed to confirm the association of leukemia with a variety of unusual dermatoglyphic patterns reported by previous investigators (19, 20).

Since our general pediatric surgery practice involves the care of a large number of children with chronic constipation (12), the study correlating dermatoglyphic patterns with early-onset constipation and abdominal pain aroused our interest (10). However, in our study, no statistical correlation between arches and functional or organic constipation could be shown.

Correlations with sexual dimorphism (15, 16) have been previously reported; however, our study did not show any significant sex differences in the fingerprint analysis.

In conclusion, this study has demonstrated that no significant correlation exists between dermatoglyphic patterns and constipation, both functional and organic. Therefore, the presence of arches on any digit

of either hand cannot be used as a screening device for organically caused constipation.

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