

**Original article:**

## **A study of ABO blood group in bronchial asthma and association with palmar dermatoglyphic parameters**

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### **ABSTRACT:**

**Introduction:** Fingerprint is the oldest, reliable and mature biometric technologies and is considered as legitimate proof of identification. The correlation has been reported between physical characteristics like fingerprints and blood groups. The present study was aimed to evaluate the association of dermatoglyphic patterns with different blood groups and also to evaluate the role of dermatoglyphics in early detection of Bronchial Asthma prone individuals and predisposition of disease.

**Methodology:** This study was conducted in 100 patients of bronchial asthma for various dermatoglyphics parameters by Modified Cotterman's technique.

**Result :** It was observed that in blood group B, the Whorl and in blood group O, Arch pattern in both hands of bronchial asthma patients was pre-dominant where as when compared to that of controls loop ulnar pattern was pre-dominant in blood group AB, the differences were highly significant for both ( $P < 0.001$  &  $0.01$ ) ( $P < 0.001$ ) respectively.

**Conclusion:** The association of blood group and different diseases with dermatoglyphics can be used as a scientific tool for early prediction and thus for prevention of the development of different diseases.

**Key word:** Dermatoglyphic palmar patterns, Main line index, Blood group, Breast cancer patients.

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### **INTRODUCTION**

Asthma is a disease of airways that is characterized by increased responsiveness of the trachea-bronchial tree to variety of stimuli resulting in widespread spasmodic narrowing of the air passages. Asthma is an episodic disease manifested clinically by paroxysms of dyspnoea, cough, and wheezing. Etiologically Asthma is classified into two broad categories; Extrinsic and Intrinsic Asthma. On the other hand ABO blood groups are a stable feature of a population and they differ among various socioeconomic, geographical and ethnic groups. There have been several studies on possible relationship of blood types to certain diseases. According to literature certain chronic diseases are associated preferentially with selected ABO and other blood groups<sup>1</sup>.

The Dermatoglyphics (derma = skin + glyphe = curve) word is literally descriptive of the delicately sculptured skin surface, inclusive of skin ridges and their configuration arrangement. The dermatoglyphic patterns make their appearance on volar aspect of palm at 12<sup>th</sup> to 13<sup>th</sup> week of gestation and are not influenced by movements of hand in utero<sup>2</sup>. The hand and its dermatoglyphics pattern have come to be recognized as a powerful tool in the diagnosis of psychological, medical and genetic conditions. Thus a significant link has been established by pioneer workers between ridge pattern and Bronchial Asthma<sup>3</sup>. Like ABO blood groups, dermatoglyphics patterns also long been used in investigation in the field of medical sciences. The present study was conducted to evaluate the association of dermatoglyphic patterns with different ABO blood groups and also to evaluate the role of palmar and plantar dermatoglyphic patterns in early detection of prone individuals and genetic predisposition of bronchial asthma disease.

**MATERIAL METHOD**

In the present study One hundred probands with/of definite clinical evidence of bronchial asthma patients were collected at P.B.M. Groups of Hospitals, Bikaner (Rajasthan). Subjects were tested for their blood groups and clinically confirmed bronchial asthma. The patients were studied to assess their association with dermatoglyphic patterns and blood groups. They were matched with One hundred healthy subjects, those who are residing in the same locality and having no family history of bronchial asthma or any other inheritable disease. Rolled impressions of the fingers and plain impressions of the palm and sole were obtained on smooth white papers by the standard Ink and Roller method of modified Cotterman’s technique <sup>4</sup>. The various palmar, plantar and digital patterns of arches, loops and whorls were counted and classified with the aid of a hand lens using Loesch and Skrinjaric’s method <sup>5</sup>. Galton in 1892 classified dermatoglyphic patterns in whorl loops and arches.

Whorl – whorl patterns, ridges courses follow circuits around the core. Patterns have two delta and at least one ridge making complete circuit. Whorls are of four type’s plain, central pocket, double loop and accidental.

Loop – loop have one or more ridges entering from one side of the print, recurring and exiting from the same side. It possesses one triradii. Loop patterns are ulnar and radial loops according to opening of respective margins.

Arch – arch pattern composed of ridges without triradii and known as plain arch. In tented arch patterns are transversely coursing ridges with abrupt elevation.

In dermatoglyphic patterns fixed points are

1. Triradii or Delta – the delta is formed by bifurcation of a single ridge and triradius is formed by three ridges radiating from a common point.
2. Core – it is a short straight ridge and form center of the pattern area.

**Table No 1 Comparison of the finger print patterns of right hand in between non-disease male and bronchial asthma with respect to their blood groups A, B, AB, O (M-Male, BA- Bronchial Asthma, \* = significant value)**

Finger Pattern	Blood Groups											
	A			B			AB			O		
	C	BA	p	C	BA	p	C	BA	p	C	BA	p
<b>Whorl</b>	10	1	0.86	181	9	<0.001	31	21	<0.001	85	20	<b>0.54</b>
<b>%</b>	40	20	-	35	90	***	62	32	***	40	44	-
<b>Loop</b>	11	2	0.88	264	1	<0.001	16	41	<0.001	106	22	<b>0.86</b>
<b>ulnar</b>	44	40	-	51	10	***	32	63	***	49	48	-
<b>%</b>												
<b>Loop</b>	1	-	-	9	-	-	1	-	-	1	-	-
<b>radial</b>	4	-	-	1	-	-	2	-	-	0.4	-	-
<b>%</b>												
<b>Arches</b>	1	1	0.19	9	-	-	-	3	-	10	7	<b>&lt;0.01</b>
<b>%</b>	4	20	-	1	-	-	-	4	-	11	38	<b>**</b>
<b>Tented</b>	2	1	<0.001	47	-	-	2	-	-	19	2	<b>0.32</b>
<b>arch %</b>	<b>8</b>	<b>20</b>	<b>***</b>	<b>9</b>	-		<b>4</b>	-	-	<b>8</b>	<b>4</b>	-

**Table No. 2 Comparison of the finger print patterns of left hand in between non-disease male and bronchial asthma with respect to their blood groups A, B, AB, O (M-Male, BA- Bronchial Asthma, \* = significant value)**

Finger Pattern	Blood Groups											
	A			B			AB			O		
	C	BA	p	C	BA	p	C	BA	p	C	BA	p
<b>Whorl</b>	6	-	-	142	9	<0.001	31	7	<0.001	74	18	<b>0.47</b>
	24	-		27	90	***	62	10	***	34	40	
<b>Loop ulnar</b>	15	3	0.1	298	1	<0.001	17	53	<0.001	119	24	<b>0.80</b>
	60	60		58	10	***	34	81	***	55	53	
<b>Loop radial</b>	-	-	-	13	-	-	-	-	-	3	-	-
	-	-		2	-		-	-		1	-	
<b>Arches</b>	2	1	0.6	10	-	-	-	4	-	9	7	<b>&lt;0.001</b>
	8	20		1	-		-	6		10	38	***
<b>Tented arch</b>	2	1	0.6	46	-	-	2	1	0.41	14	3	<b>0.97</b>
	8	20		9	-		4	1		6	6	

**RESULTS**

In (Table -1) as comparison of right hand between blood groups of control and bronchial asthma patients, shows significant importance. In blood group A, Tented arch pattern parameter showed significant value ( $p < 0.001$ ). In blood group AB & B, whorl and loop ulnar pattern parameter showed significant value ( $p < 0.001$ ). In blood group B whorl pattern were observed 35% in control and 90% in patients while in blood group AB control was 62% while 32% in patients. In blood group AB, loop ulnar pattern were found to occur in 32% controls while their presence in patients was 63%. In blood group O, arch pattern were found to occur in 11% controls while their presence in patients was 38%. The parameter showed significant value ( $p < 0.01$ ). In (Table -2) as comparison of left hand between blood groups of control and bronchial asthma patients show significant values. In blood group B of left hand whorl and loop ulnar patterns found statistically significant. Whorl was found to occur in 27% controls while its presence in patients was 90% in blood group B. The parameter showed significant value ( $p < 0.001$ ). In left hand of blood group B Tented arch pattern were observed in patients 90% and 27% in control group, parameter showed significant value ( $p < 0.001$ ). In blood group AB, whorl and loop ulnar pattern parameter showed significant value ( $p < 0.001$ ). In blood group O, arch pattern were found to occur in 10% controls while their presence in patients was 38%. The parameter showed significant value ( $p < 0.001$ ).

**DISCUSSION**

Tented arch is significantly higher in right hand of patients from A blood group ( $p < 0.001$ ). Whorl pattern is significantly greater in both hands of patients than controls, with B blood group ( $p < 0.001$ ). Loop ulnar patterns are significantly greater in both hands of controls than patients with B blood group ( $p < 0.001$ ). Whorl pattern is

significantly greater in both hands of controls than patients with AB blood group ( $p = <0.001$ ). Loop ulnar patterns are significantly greater in both hands of patients than controls with AB blood group ( $p = <0.001$ ).

The study shows that highest prevalence of bronchial asthma is found in AB blood group then in O blood group. Association of dermatoglyphic patterns with blood group in patients of bronchial asthma shows that there is increased incidence of tented arch in A blood group. Whorls and loop ulnar patterns are higher in B blood group. Loop ulnar and whorl are higher in AB blood group. Incidence of arch pattern is higher in O blood group.

Gupta et al observed the percentage of whorls was more in Bronchial Asthma patients p value is  $<0.001$ , statistically it is highly significant and similar with finding of present study<sup>6</sup>. Studies has shown that patients affected with arthritic diseases and bronchial asthma a relationship with blood type O reported, whereas the patients affected with diabetes and asthma were more typically for blood group type A<sup>7</sup>. Few Investigators reported that for the respiratory allergy, the blood group type O was at greatest risk, whereas resistance to respiratory allergies was associated with blood group type AB. Blood group O was associated with childhood asthma, and may act as one of the predominant factors for environmental triggers of allergy for asthmatic children in Taiwan<sup>8</sup>. In a study of 228 coal miner's affected with asthma, blood type O was significantly related to non-secretor phenotype. Lower lung function was observed in blood group type A, and in a lesser extent in blood group type B<sup>9</sup>. Dzhvarisheishvili et al observed that bronchial asthma starts somewhat faster in blood group O when stimulated with a strong allergen from occupational exposure<sup>10</sup>.

## CONCLUSION

On the basis, of this study it has been opined that any epidermal ridge alterations in individuals have a distinctive dermatoglyphic feature, which remain unchanged throughout life. So the association of blood group and different diseases with dermatoglyphics can be used as a scientific tool for early prediction and thus for prevention of the development of different diseases.

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