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PALM CREASE MARKING: can it predict the sex of the next child?

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ABSTRACT.

Background: Infertility is an important problem in our environment and indeed worldwide because the desire to bear children is more pronounced among married couples especially in Africa and in particular Nigeria where family life is child centred. Couples with infertility face marital break-up and are ostracized from society. Similarly couples without a male child face the same predicament since inheritance in our environment is along the male lineage. A couple with only female children even if they are five will still be searching for a male child. This is regarded as “sex infertility”. Therefore pre-conception sex selection is gaining recognition in our practice as an answer to this societal need.

Objective: To answer the question, can the palm crease markings of a child predict the sex of the immediate next offspring of a couple? If so, to what degree?

Study design and method: The study is designed in 2 phases. In phase 1; 213 medical students were recruited randomly and their palm crease pattern and the sex of their immediate younger sibling recorded. Information on miscarriage or use of fertility drugs by the mother before the next birth was noted. In phase 2; antenatal mothers who are Para 1 and above, conceived naturally (without manipulation) from the same partner and had no intervening miscarriage, ectopic or molar pregnancy were recruited. The palm crease pattern of the last child was read and the sex of the baby in the index pregnancy predicted. The predicted and actual sexes at birth were compared and the predictive value determined.

Results: Two characteristic palm crease pattern were defined. Pattern A was associated with male sex and pattern B with female sex. In phase 1 of the study, the palm crease pattern predicted sex corresponded with the sibling’s actual sex in 53.8% of the 213 students. This figure rose to 69.2% after exclusion of 47 cases where the mother had intervening miscarriage, ectopic pregnancy or still birth. This increase is significant ($P < 0.05$). In Phase 2, out of the 158 antenatal mothers the predicted sex agreed with the actual sex of the baby at birth in 152 clients giving 96.2% predictive value.

In conclusion: Palm crease marking is a reliable tool for predicting the sex of the next child of a couple. This knowledge could be used effectively in preconception sex selection to determine those couple that will require using other methods to achieve their desired sex.

Keywords: Palm crease, sex prediction, sex selection.

INTRODUCTION

Infertility is an important problem in our environment and indeed worldwide where at least one in every ten couples of reproductive age is affected by infertility ¹. This is because the desire to bear children is more pronounced among married couples especially in Africa and in particular Nigeria where family life is child centred. Couples with infertility face marital break-up and are ostracized from society and the woman is usually blamed for the childlessness ². Similarly couples without a male child face the same predicament since inheritance in our environment is along the male lineage. A couple with only female children even if they are five will still be searching for the missing male child. This is regarded as “sex infertility”. The woman is also blamed for not bearing a male child and some men indulge in marrying many wives peradventure one will bear the illusive male child. This is one of the reasons for polygamy in our monogamous Christian society².

For the above reasons, pre-conception sex selection is gaining recognition in our practice as an answer to this societal need. Several methods have been used for pre-conception sex selection namely: medicodietary method, ovulation detection & timed intercourse and flow cytometric sperm separation ³⁻⁵. However, extensive literature search revealed that palm crease marking has not been used for this purpose though it has been linked to some disease conditions and syndromes like Downs⁶, Kabuki make-up⁷ and alcohol embryopathy⁸. It has also been shown that the presence of the Sydney crease is associated with the occurrence of preterm and term low birth weight deliveries⁹.

This study is therefore directed at answering the question, ‘can the palm crease markings of a child predict the sex of the immediate next offspring of a couple’, if so, to what degree?

SUBJECTS AND METHOD:

Study design: This study is in 3 phases.

- Phase 1 is a retrospective review of the palm crease markings of medical students and the sex of their immediate sibling.
- Phase 2 is a prospective prediction of the sex of the immediate next child of a couple using the palm crease markings of the immediate previous child.

In phase 1 (Oct to Nov 2004):

Medical students were recruited randomly and their palm crease marking using the dominant hand and the sex of their immediate younger sibling were recorded. Information on whether the mother had any intervening miscarriage, still birth or used fertility medication between their birth (as much as they could recollect) was noted.

In phase 2 (Feb 2005 to July 2006)

Antenatal mothers (Para 1 and above) who conceived **naturally** (non use of fertility treatment) and **spontaneously** (no cycle manipulation) from the **same partner** after the last baby and who had no **intervening miscarriage, ectopic or molar pregnancy** were recruited into the study. They all had an early ultrasound scan for diagnosis of the pregnancy and those with multiple pregnancies were excluded.

The palm crease marking of the immediate last child using the dominant hand was noted and the sex of the baby in the index pregnancy predicted and recorded. The predicted sex and the actual sex of the baby at birth were compared and the predictive value determined.

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RESULTS:

Phase 1 of the study.

Two characteristic palm crease markings were identified and defined as pattern A and pattern B.

Pattern A shows **Fusion** of the first two proximal palmer markings at the radial border of the palm a.k.a. *radial fusion*. The third or distal palmer crease runs from the ulnar border to the space between the index and middle fingers. (see Figure 1).

Pattern B shows a **Non-Fusion** of the first two proximal palmer markings at the radial border of the palm a.k.a. *radial non-fusion*. The third or distal palmer crease is same as in pattern A. (see Figure 2).

A total of 213 students were enrolled. Eighty six had pattern A palm crease and 127 had pattern B as shown in table 1a. The pattern A palm crease was predominantly associated with male sex in **52.3%** (45 of 86) of the next siblings. This figure increased to **66.2%** (45 of 68) after exclusion of 18 cases where the mother had intervening miscarriage or still birth (see table 1b). This increase is statistically significant ($P < 0.05$). The pattern B palm crease was predominantly associated with female sex in **55.1%** (70 of 127) of the next siblings. This figure increased to **71.4%** (70 of 98) after exclusion of 29 cases where the mother had intervening miscarriage or still birth (see table 1b). This increase is statistically significant ($P < 0.05$).

At the end of phase 1 of the study: the pattern A palm crease was regarded as **male crease** while the pattern B palm crease was regarded as **female crease** in accordance with the sex they defined.

Phase 2 of the study.

Out of the 158 pregnant mothers enrolled, the predicted sex agreed with the actual sex of the baby at birth in 152 clients giving a 96.2% accuracy rate (see table 2).

Further analysis of the sensitivity, specificity and predictive value of each palm crease pattern is shown in tables 3 and 4 below.

Table 3 shows that pattern A palm crease (Male crease) has a sensitivity of **94.5%** ($^{69}/_{73}$ or 0.9452) and a specificity of **97.7%** ($^{83}/_{85}$ or 0.9765). This gives a positive predictive value of **97.2%** ($^{69}/_{71}$ or 0.9718) for male sex in the immediate next child.

Table 4 shows that Pattern B palm crease (Female crease) has a sensitivity of **97.7%** ($^{83}/_{85}$ or 0.9765) and a specificity of **94.5%** ($^{69}/_{73}$ or 0.9452). This gives a positive predictive value is **95.4%** ($^{83}/_{87}$ or 0.9540) for female sex in the immediate next child.

DISCUSSION

The pattern A palm crease (**male or radial fusion crease**) had a 97.2% predictive value for male sex in the immediate next child. The pattern B palm crease (**female or radial non-fusion crease**) had a 95.4% predictive value for female sex in the immediate next child. This is a natural sex prediction tool and clearly utilises existing variables in a family to inform them of the possible sex of the next child. It is cost effective and only requires training and a good understanding of the palm crease as describe above. This could be likened to Billings's ovulation method which utilises body signs¹⁰. The success of Billings's ovulation method is usually linked to accurate timing and good understanding of the cervical mucus¹⁰. This is also the case with the use of the palm crease marking in sex prediction

It therefore implies that the gene responsible for the palm crease marking may be located in any of the sex chromosomes. This position will still be confirmed by further research which is beyond the scope of this work. The standardization of this tool to take into consideration variants of the two patterns described, its possible application in multiple births and best application in clinical practice need to be streamlined.

Gender preferences and demand for preconception sex selection is gaining recognition in our environment where a family without a male child is denied inheritance. This is also true of Pakistani women, who do show a statistically significant preference for boys over girls¹¹. However, preconception sex selection for non medical reasons in our environment is only demanded by those who in most cases have not gotten a male child. This desire for a "gender balanced family" cannot distort the natural sex ratio as has been shown by representative social surveys conducted in Germany, the United Kingdom, the United States and Hungary^{5,12,13}.

Opposition to the use of sperm separation for family balancing or sex selection has been on the basis of cost and inconvenience of the treatment¹⁴. Palm crease reading which is natural, cheap and convenient could be of help in allowing couples to have a choice of intervention in seeking sex selection if the predicted sex is unfavorable. This could reduce cost and stress compared to a blind general pursuit of sex selection as those whose predicted sex are favorable will be saved the trauma of expenses and otherwise.

CONCLUSION

Palm crease marking of a child with greater than **95%** positive predictive value for the sex of the immediate next child of a couple is a reliable tool for preconception prediction of the sex of the next child. This knowledge could be used effectively in preconception sex selection to determine those couple that will require using other methods to achieve their desired sex.

Table 1a: Palm crease pattern and the sex of the next sibling (uncorrected).

<i>Palm crease type</i>	<i>Sex of the next sibling</i>		<i>Total</i>
	<i>Male</i>	<i>Female</i>	
Pattern A	45 (52.3%)	41 (47.7%)	86 (40.4%)
Pattern B	57 (44.9%)	70 (55.1%)	127 (59.6%)
			213 (100.0%)

Table 1b: Palm crease pattern and the sex of the next sibling (corrected).

<i>Palm crease type</i>	<i>Sex of the next sibling</i>		<i>Total</i>
	<i>Male</i>	<i>Female</i>	
Pattern A	45 (66.2%)	23 (33.8%)	68(41.0%)
Pattern B	28 (28.6%)	70 (71.4%)	98 (59.0%)
			166 (100.0%)

Table 2: Sex prediction of the immediate next child according to the palm crease pattern.

<i>Palm crease type</i>	<i>Sex Prediction</i>		<i>Total</i>
	<i>Correct</i>	<i>Wrong</i>	
Pattern A	69	2	71
Pattern B	83	4	87
Total	152 (96.2%)	6 (3.8%)	158 (100%)

Table 3: The predictive value of Pattern A (male crease) palm marking.

<i>Male crease</i>	<i>Sex Prediction</i>		<i>Total</i>
	<i>True</i>	<i>False</i>	
Positive	69	2	71
Negative	4	83	87
Total	73	85	158

Table 4: The predictive value of Pattern B (female crease) palm marking.

<i>Female crease</i>	<i>Sex Prediction</i>		<i>Total</i>
	<i>True</i>	<i>False</i>	
Positive	83	4	87
Negative	2	69	71
Total	85	73	158

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