THE TURKISH JOURNAL OF
PEDIATRICS
A HACETTEPE BULLETIN VOLUME 11/NUMBER 3/JULY 1969

The Prevalence of Simian Lines in a Sample of the Turkish Population

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Attention has already been drawn to the correlation which exists between the presence of simian lines (four finger line and single transverse palmar crease) and congenital abnormalities. This study is an attempt to determine the prevalence of simian lines in the Turkish population. It was felt that a previous attempt at a similar assessment employed too small a number of cases for firm conclusions to be made [1]. Our concern was not with the occurrence of simian lines in conjunction with congenital abnormalities, excellent reviews of this subject having been made by Alter[2] and Miller, [3] but rather with their occurrence in the normal population.

Surveys have been conducted to determine the frequency of such lines in different countries, from which it would appear that there is an increasing frequency of simian lines as one progresses from western to eastern countries. [3-6] It was hoped that in view of the geographical situation of Turkey the present study would lend support to this observation.

It was also proposed that patients presenting unilateral or bilateral simian lines should have their blood groups determined in an attempt to find any correlation between these two factors.

As an incidental finding from the study it was proposed that the age distribution of patients visiting a Turkish pediatric outpatient polyclinic be determined.

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Material and Methods

We defined a simian line as a single transverse palmar crease crossing continuously from the radial to the ulnar side. Transitional forms, as described elsewhere,[5] were not included. This is a definition which has been used by other authors[1,5].

The hands of 1,347 consecutive patients attending the pediatric outpatient polyclinic of Hacettepe Hospital, Ankara were examined for simian lines. This was done by the screening doctor, whom all the patients attending the clinic had to pass. The system at Hacettepe is that patients come both for conditions which would normally be dealt with by the general practitioner or family doctor in western countries (e.g. upper respiratory tract infections and minor infectious diseases such as measles), and for more serious infections (e.g. tuberculosis) and congenital abnormalities (e.g. congenital dislocation of the hip and ectopia vesicae). Thus a wide range of clinical conditions was encountered in this survey.

All patients with bilateral simian lines were examined for the presence of congenital abnormalities and a similar, but more cursory, examination was made of patients with unilateral simian lines.

Where possible (in 37 cases) blood group determinations were made on children with simian lines (unilateral or bilateral).

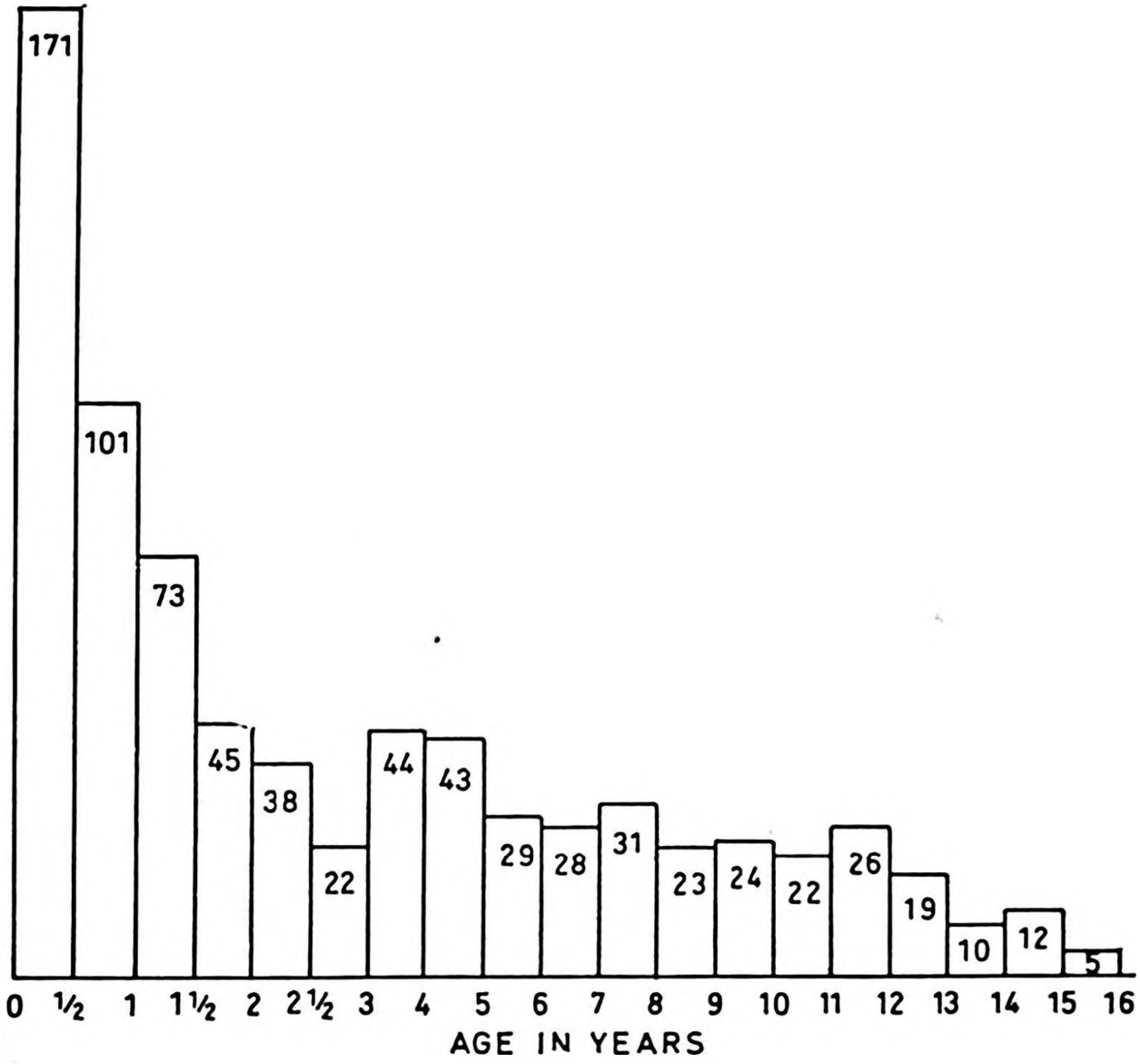
Observations and Results

The hands of 1,347 patients, 797 male and 550 female, were examined. The ages of the first 766 were noted and found to range between 10 days and 16 years, approximately 50 per cent of patients being under two years of age. Their distribution by age is shown in the accompanying histogram.

A total of 45 patients (3.34 per cent) was found to have simian lines, of whom 36 were male (4.52 per cent) and nine were female (1.64 per cent). Of the 1,347 patients, 30 (2.23 per cent) possessed unilateral and 15 (1.11 per cent) bilateral simian lines. The figures and the frequency by sex of simian lines in the right and left hands are summarized in Table I.

Only five out of all the patients with simian lines (all bilateral) showed congenital abnoramlities (see Table II). When these five are abstracted from the total, the frequency of simian lines in the "normal" population is seen to be 3.0 per cent. The difference between the prevalence of simian lines in males and females omitting the cases of congenital abormalities, is highly significant ($P < 0.001$). However, no significant difference was

Histogram of
Distribution by Age of Pediatric Outpatient Population
at Hacettepe Hospital*



* TIME SCALE HAS BEEN ALTERED FOR CONVENIENCE

TABLE I

INCIDENCE BY SEX OF SIMIAN LINE IN TURKISH CHILDREN

SEX	Total		Unilateral		Bilateral		Right Hand only		Left Hand only	
	No.	% By Sex	No.	% By Sex	No.	% By Sex	No.	% By Sex	No.	% By Sex
Male	36	4.52	22	2.76	14	1.76	15	1.88	7	0.88
Female	9	1.64	8	1.46	1	0.18	4	0.73	4	0.73
		%		%		%		%		%
Male+ Female	45	3.34	30	2.23	15	1.11	19	1.41	11	0.82

found between the prevalence of simian lines in the right and left hands ($P > 0.1$), nor was there any significant difference between the prevalence in the right and left of hands males only ($P > 0.05$).

TABLE II

SIMIAN LINE ASSOCIATED WITH CONGENITAL ABNORMALITIES

SEX	SIMIAN LINE	Congenital Abnormality
1. Male	BILATERAL	Down's Syndrome
2. Male	BILATERAL	Short-stature, microcephaly, wide-nasal bridge with upturned noses, mental, motor + speech retardation: clinodactyly: syndactyly 2 nd – 3rd toes, hypothyroidism: pes planos?
3. Male	BILATERAL	Mental Retardation + Fits
4. Female	BILATERAL	Bilateral Congenital Dislocation of the hip
5. Male	BILATERAL	Bilateral Congenital Dislocation of the hip

It must be stressed that our "normal" population is taken from those attending a pediatric outpatient clinic, and the results obtained may diffor from those of a non-hospital population.

The results of blood group determinations in patients with simian lines (unilateral and bilateral) are given in Table III. These figures correspond with the values found in the normal Turkish population. [7 8 9]

TABLE III

BLOODGROUPS AND SIMIAN LINES

SEX	A Rh (+)	A Rh(—)	B Rh (+)	AB(Rh)+	O Rh(+)
Male	4	1	6	2	8
Female	3	–	1	–	2
Right Hand	8	–	3	1	5
Left Hand	2	–	2	–	4
Bilateral	7	1	2	1	1
Right Hand Male	6	–	3	1	5
Left Hand Male	2	–	2	–	2
Right Hand Female	2	–	–	–	–
Left Hand Female	–	–	–	–	2
Bilateral Male	6	1	2	1	1
Bilateral Female	1	–	–	–	–
Total	17	1	7	2	10

Discussion

The frequency of simian lines in an American study of 500 normal, control children was found to be 1.8 per cent, in 100 consecutive children attending on outpatient clinic in Oxford, England, Davies and Smallpiece found a frequency of 3.0 per cent; in İzmir, Turkey, Tunakan found a frequency of 3.5 per cent in 260 normal children, and quotes Dr. W. W. King as finding 13 per cent in a study made in China; Van der Weil[6] also reports an increased frequency of simian lines in yellow-skinned males compared to Dutchmen. The results of our study give a frequency of 3.0 per cent simian lines in the normal population, and this corresponds to the figure given by Tunakan.

Davies and Smallpiece [5] found that 1.4 per cent of the children they studied had congenital abnormalities associated with simian lines, their "normal" population therefore being 1.6 per cent. This corresponds with the figure given by Achs et al in their study in America. The difference betweeen the frequency of simian lines in a "normal" population in England

and the U.S.A. and that in the present Turkish study is significant ($P < 0.02$). This supports the observation that an increasing prevalence of simian lines is found as one progresses from western to eastern countries.

It is interesting to note the highly significant difference in the frequency of simian lines between males and females in Turkey. Such significant analyses do not appear to have been made in any other country.

If one assumes that the manifestation of simian lines is determined by multifactoral genetic processes and environmental factors as appears likely from the diversity of congenital abnormalities reported to be associated with them, [2-3] it would appear from our study that at least one of these factors may be partially sex-linked. In this context it is of particular interest that in two cases of bilateral simian lines occurring in males, one parent was also found to have bilateral simian lines, the other parent being normal. In one of these families a twin male sibling of the patient had a unilateral simian line. Geographical distances prevented full examination of the families concerned, but we would recommend further studies of such familes as they may give some indication of a stronger genetic transmission of this character.

In this study there were twice as many cases of unilateral simian lines (2. 23 per cent) as bilateral (1. 11 per cent), but there was no significant difference between the occurrence of simian lines in the right and left hands (males and females together or males alone). This may be due to the small numbers involved, and further studies may confirm or disprove these findings.

Summary

The prevalence of simian lines in 1,347 children attending a Turkish pediatrics outpatient polyclinic was found to be 3.34 per cent. There were twice as many cases of unilateral simian lines (2. 23 per cent) as bilateral (1.11 per cent).

The difference between the frequency of simian lines in males (4.52 per cent) and females (1.64 per cent) was statistically highly significant ($P < 0.001$). It is suggested that one of the genetic factors determining the presence of simian lines may be partially sex-linked.

The prevalence of simian lines in this survey is discussed in relation to similar observations in other countries, and tends to support the suggestion that there is an increasing prevalence from western to eastern countries. No relationship was found between blood groups and simian lines.

Acknowledgemennts

We wish to express our thanks to Professor Burhan Say for his invaluable assistance during the course of this study. We are also indebted to members of the Pediatric, Hematology and Genetic Departments of Hacettepe Hospital for their help.

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