

Angle atd in Mentally Retarded Children

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ABSTRACT Three hundred and fifteen plam prints were collected and analysed for palmar patterns. The association between mental retardation and angle atd was examined in the present paper. The present paper reports that the angle atd appears to increase with the severity of the disease.

INTRODUCTION

The concept of atd angle was first introduced by Penrose (1949). It is the measure of the angle between triradii a,t and d. Its usefulness as a discriminative observation in various abnormal conditions such as chromosomal syndromes is well elucidated.

MATERIAL AND METHODS

Three hundred and fifteen mentally retarded children of both sexes aged below 15 years were drawn from schools and special institutions from different areas of Vizianagaram, Visakhapatnam, East Godavari Krishna and Guntur districts of Coastal Andhra Pradesh, South India. To serve as controls, 305 age and sex matched healthy children drawn from same geographical areas were chosen for the present study. Bilateral inked impressions were collected and plam prints were analysed using the methods described by Cummins and Midlo (1961). If there is more than one axial triradius, the distal one is used for measurement of the angle atd (Holt, 1968). The classifications of mental retardation was mainly based on IQ tests developed by American Association on Mental Deficiency (Ingalls, 1978).

RESULTS AND DISCUSSION

Among males (Table 1) angle atd shows the maximum frequency in moderate (32.56%),

severe patients (38.26%) and controls (41.91%) in the 40°–44° range, except in the mild retardates, where it is 35°–39° range (36.76%). The next high frequency is 35°–39° range in moderate retardates (23.84%) and controls (29.90%) and 50° range in severe patients (23.48%) and 40°–44° range in mild retardates (30.15%).

Among females angle atd shows the highest frequency in the mild (34.62%), severe (43.30%) and controls (42.08%) in 40°–44° range, while it is >50° in moderate (34.57%) patients. Next follows the incidence in the range of 45°–49° in the mild (30.77%) and severe (32.62%) patients, but in moderate group (25.93%) it is in 40°–44° range, whereas in controls it is in 35°–39° range.

In both the sexes of all patient groups and controls, the least frequency is found in the range of <35° with the exception of female severe retardates, where this range is totally absent. Probably this contributes towards the higher value of atd angle in female patients compared to male patients in the present data.

χ^2 test between the patient groups and controls suggests highly significant differences among males in the severe retardates in their both left ($\chi^2 = 17.6440$; .01>p>.001; d.f. = 4) and right hands ($\chi^2 = 17.8095$; .01>p>.001; d.f. = 4) and only in the left hands of the moderate retardates ($\chi^2 = 17.4349$; .01>p>.001 d.f. = 4). Also in females in their left ($\chi^2 = 12.5220$; .02>p>.01; d.f.=4) and right $\chi^2=15.2983$; .02>p>.01; d.f. 4) hands of the moderate retardates but only in the left hands ($\chi^2 = 11.0377$; .05>p>.02; d.f. = 4) of the severe retardates, the differences are significant.

Mean atd Angle : For the combined means of the left and right hands, it is observed that

Table 1: Percentage distribution of angle atd, means and standard errors in mentally retarded children and controls

Side	Group	No. tested		<35°		35°-39°		40°-44°		45°-49°		>50°		Mean ± S.E.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Left (L)	Mild	68	39	8.82	5.13	38.24	7.69	27.94	35.90	14.71	30.77	10.29	20.51	41.60 ± 0.87	44.79 ± 0.94
	Moderate	86	40	10.47	2.50	19.77	15.00	27.91	22.50	23.26	27.50	18.60	32.50	44.01 ± 1.01	45.90 ± 1.04
	Severe	57	23	7.02	—	10.53	4.35	42.11	30.43	17.54	43.48	22.81	21.74	44.89 ± 1.23	47.35 ± 1.71
	Controls	201	102	5.97	3.92	30.35	26.47	41.79	38.24	14.93	20.59	6.97	10.78	41.31 ± 0.37	42.86 ± 0.65
Right (R)	Mild	68	39	5.88	—	35.29	23.08	32.35	33.33	11.76	30.77	14.71	12.82	42.18 ± 0.93	43.69 ± 0.94
	Moderate	86	41	10.47	4.88	27.91	9.76	37.21	29.27	11.63	19.51	12.79	36.59	41.26 ± 0.66	45.80 ± 1.09
	Severe	58	23	3.45	—	22.41	13.04	34.48	52.17	15.52	21.74	24.14	13.04	46.24 ± 1.40	44.78 ± 1.66
	Controls	207	100	6.76	3.00	29.47	25.00	42.03	46.00	15.94	14.00	5.80	12.00	41.48 ± 0.38	42.47 ± 0.64
L + R	Mild	136	78	7.35	2.56	36.76	15.38	30.15	34.62	13.24	30.77	12.50	16.67	83.78 ± 1.27	88.49 ± 1.32
	Moderate	172	81	10.47	3.70	23.84	12.35	32.56	25.93	17.44	23.46	15.70	34.57	85.27 ± 1.18	91.70 ± 1.51
	Severe	115	46	5.22	—	16.52	8.70	38.26	41.30	16.52	32.61	23.48	17.39	91.14 ± 1.86	92.13 ± 2.40
	Controls	408	202	6.37	3.47	29.90	25.74	41.91	42.08	15.44	17.33	6.37	11.39	82.79 ± 0.53	85.33 ± 0.91

the female patient group shows a comparatively higher value (Mild = 88.49; Moderate = 91.70; Severe = 92.13) for the angle atd than the male patient groups (Mild = 83.78; Moderate = 85.27; Severe = 91.14). Bilaterally the angle atd values are more or less equally distributed in both hands among sexes except a small deviation (Table 1). In both the male and female patient groups the values are higher for the mean angle atd than do the control males and females. It is also interesting to note, the value of mean angle atd ascendingly increases with the severity of the disease in both sexes of the patient group.

When the patient groups and controls are compared significant differences are found in severe ($t = 5.9503$; $p > .001$) and moderate ($t = 2.2181$; $.05 > p > .02$) male retardates only, and also in the case of females significant differences are observed in severe ($t = 3.0555$; $.01 > p > .001$) and moderate ($t = 3.6820$; $p > .001$) retardates only.

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