Blood Pressure Study in Children: Preliminary Data

By

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It is surprising how seldom a blood pressure measurement is taken in children whose physical examination is otherwise carried out throughly in most cases. It is only when a Cardiac Condition is suspected that blood pressure is usually taken. It is necessary that blood pressure should be taken in all children with correct Cuff sizes, so as to eliminate any error in the B.P. reading[2].

Reports of hypertension in children in the advanced countries have increased in the last decade. In Pakistan a study reported by Dr. Raza et al., in 1968 and 1971 [5,12], has given a prevalence in school children of systolic hypertension in 5% boys and 8% girls (Total 3361 children), while diastolic hypertension was only present in 0.57%.

In addition the West Pakistan Nutrition Survey[10] has reported systolic hypertension in 1.9% males and 10.9% females in 5-19 years age group, in rural areas; and in 2.8% in females in urban areas. The diastolic hypertension is 2.2% in rural, and 5.5% in urban areas.

A recent study on Juvenile hypertension in Peshawar has been reported by Mohammad Ilyas, et al.,[7] this gves a prevalence of 1.6% in males and 1.3% in females in 5-20 years age group, belonging to school and colleges.

Material:

In order to assess the range of blood pressure in Karachi Children and to find out the prevalence of hypertension, a study of healthy school children varying in age from 2-1/2 to 17 years was carried out. Blood pressure was taken by standard method using various cuff sizes according to the age and weight of the patients. A mercury manometer was used. The criteria for hypertension was taken as blood pressure above the 90th, percentile for age.

140 patients from Paediatric Outpatients department were also studied. Of these there were 71 children from the Well Baby Clinic of ages 0-5 years, and 75 children from the outpatients department ages 6-12 years. These latter were sick children who belong to poor socio-economic groups. Urine tests were done in school children with high blood pressure while the OPD groups were admitted and investigated.

Results:

Jinnah Postgraduate Medical Centre, Blood Pressure Study

Well Baby Clinic.	71 cases.
Age:	0-5 years.
Males	45
Females	36

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Abnormal Blood Pressure	3 (4.2%)
Family History positive in	2
Father Hypertensive.	1
Mother Hypertensive.	1
Acute Glomerulonephritis.	1

Children—OPD J.P.M.C.

Total.	75 Children
Age.	0-12 years.
Males.	42
Females.	33
High B.P.	130/90
3 Males and 1 Female	4
Age.	8-12 years.
1 with positive family history.	
Prevalence.	5.3%

Boys Secondary School: High Socio-Economic Group

Boys Total.	110
Only 1 child with high B.P. on Steroids	
Prevalence.	0.9%

Secondary School for Boys and Girls: High Socio-Economic Group

Age.	5 to 10 years.
Girls.	90
Boys.	14
Total.	104

Systolic Hypertension: Systolic Blood Pressure 130 to 140 in 4 children.
Diastolic not more than 80.
All 4 over weight for age.
Prevalence of Systolic Hypertension in boys: 16.6%.

Girls Primary School: High Socio-Economic Groups

Age.	4-9 years.
Total.	50 Children
Hypertension.	1
Prevalence.	2.0%

Aga Khan Secondary Schools

Age.	7-16 years
Boys.	100
Girls.	100
Total	200
Hypertension	Nil.

Overall Total:

School Children. (Age 4-16 years)	Boys	224
	Girls	240
Total		464
Systolic Hypertension only		4 Children
Prevalence		0.8%
Systolic and Diastolic Hypertension		2 Children.
Prevalence		0.2%

Discussion

Essential Hypertension is rare in children[4]. From all reports it is the secondary type wich occurs especially due to kidney diseases, intake of steroids, adrenal tumours, coarctation of Aorta, and diseases of the Nervous system[2].

Increase in systolic pressures is found in Thyrotoxicosis, arterio-venous shunts, and hyperkinetic circulatory states. Diastolic hypertension may be due to acute nephritis when it is transient, or periodic in pheochromocytoma, and sustained as in chronic renal disease[9].

Meneely and Dahl[1] have produced evidence in rats that excess salt intake leads to hypertension. When rats are given 2% salt in the diet they remain normal, when the salt intake is from 2.8% to 5.6% there was moderate hypertension while intake of 7% or more produced severe hypertension, growth retardation, and arteriolar lesions were seen in the Kidneys.

In advanced countries like USA it was seen that early introduction of weaning food, especially canned foods led to high intake of salt and this may cause hypertension[1,3]. In one study 2% hypertension was reported in infants from 0-2 years age. Those started on solid food at 3 months were consuming twice as much sodium as those starting at 5-7 months. They were receiving 10 mEq per day from solid food alone, while the average intake should not exceed 2.6 mEq in 24 hours[11]. Committee of food and Nutrition recommended that salt intake of infant food should be reduced.

In Japan 20% adults have hypertension. Their diets contain 500 mEq of sodium daily. In USA adult intake is 130-300 mEq in 24 hours. Isaccson[6] has reported 22% incidence of hypertension in Bantu Males, whose intake of sodium is 310 mEq per day. Eskimos are free from hypertension and their intake of salt is only 30 mEq per day.

It is likely that excess intake of salt affects those with a positive family history of hypertension. The findings of infants with hypertension has lead to the possibility that the process begins early in life or even before birth.

In addition these are genetic and environmental factors involved in producing hypertension. Among the latter, stress and salt intake must be considered. Londe[2] has reported 2.3% incidence of hypertension in 1473 children, aged 4-15 years, while Jennifer Logie[9] has given an incidence of 1 to 2% in children.

According to Pereira 35% of children had no cause while obesity may be a factor in adolescent girls. 15% were probably due to encephalitis and brain diseases.

Kilkoyne, et al.,[8] have reported 2-3% adolescents with hypertension, which may be seen with obesity, smoking and hyperlidemia. Hence it is important to check blood pressure regularly during school year.

Summary

Blood Pressure check in 464 School children showed hypertension in 1.4%; of these there were none with history or findings of kidney diseases. HBP family history was present in 2 children and 2 children were over-weight for age (74th Percentile of Harvard Scales). These belonged to High Socio-Economic groups. Urine tests were normal in these children.

In the hospital group the prevalence of hypertension was higher, being 4.7%. These all belonged to the lower socio-economic group and 75 were sick children from the children out patients department.

Compared to previous study in school children by Raza et al., West Pakistan Survey and Peshawar study we have found a prevalence rate of only 1.4% while the previous reports showed 6.5% and 5.5% prevalence respectively in the first two studies.

As the number of children in each group are small, further study is in progress to see

the average blood pressure range in school children, and also elicit the causes in those with high blood pressure.

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