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LETTER TO THE EDITOR

COLD PRESSOR RESPONSE IN NORMAI AND MALNOURISHED CHILDREN

Sir,

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There have been various reports indicating involvement of the central and peripheral parts of ANS in malnutrition. Involvement of CNS in patients with severe undernutrition was shown by Fishman et al. in 1969 (1). Heinrich in 1982 (2) showed that inadequate nutrition produces ANS dysfunction. More recently, Sethi et al. (3) and Tandon et al. (4) have shown elctrophysiological evidences of sensory impairment. Also, sweat production in malnourished children has been reported to be less than in normal or in children recovered from malnutrition (5). It was attributed not to poor skin blood flow as the peripheral blood flow in response to a heat stimulus is greater in the malnourished child. It was thought to be due to a defect in the ANS. A study conducted by Krishnamurty et al. in 1987 (6) compared the immediate cardiac response to lying down in normal and malnourished children. It was observed that the malnourished group had a lower standing to lying ratio as compared to the control group. This suggests a possible autonomic deficiency in malnourished children.

In our laboratory, we have conducted this study on 30 normal children aged 5 to 10 years (mean 6.8 years) and 30 malnourished children also aged 5 to 10 years (6.8 years). The malnourished children had body weight below 2 standard deviations of age and sex specific National Centre for Health Statistic Centre (NCHS) Standards (7). The test was performed under thermoneutral conditions and at the same time of the day in all subjects. Subjects were allowed to acclimatize themselves to the experimental and environmental conditions. During this period, detailed history and medical examination was carried out to rule out any other cause of autonomic dysfunction in the subjects.

Cold pressor response (CPR) was then carried out on all the subjects as per the method of Le Blanc et al. (8). Resting BP was recorded with the subject seated comfortably. The subject was then asked to immerse his hand in cold water and the temperature was maintained at 4 to 6°C through out the procedure. BP measurement were made from the other arm at 30 sec interval for a period of 2 minutes. After this the subject was allowed to remove his hand from the water.

Maximum increase in systolic and diastolic BP was recorded. For each variable group, mean and standard deviation of the mean were calculated, Inter–group mean differences were tested for significance by Student's t–test.

TABLE I : Showing BP values before and after Cpt in control and malnourished children.

Control						*Malnutrition*					
Before		*After*		*CPR*		*Before*		*After*		*CPR*	
SBP	*DBP*	*SBP*	*DBP*	*SBP*	*DBP*	*SBP*	*DBP*	*SBP*	*DBP*	*SBP*	*DBP*
112.53 ± 6.66	72 ± 4.61	126.73 ± 7.21	86.73 ± 5.39	14.2 ± 2.43	14.6 ± 2.79	103.73 ± 6.69	69.83 ± 3.77	122.53 ± 6.81	84.43 ± 4.44	13.8* ± 2.25	14.6 ± 2.3

SBP : Systolic Blood Pressure

DBP : Diastolic Blood Pressure

*P<0.05

The results showed that the resting systolic blood pressure was significantly lower in the malnourished group (P<0.05) although the diastolic blood pressure did not show any such difference. Following the cold pressor test, both the control and malnourished group showed significant increase (P<0.001) in the systolic BP and diastolic BP in response to CPR. But in comparison to the control group, the mean rise in systolic BP was significantly lesser (P<0.05) in the malnourished group; while the mean increase in diastolic BP was not significant.

The cold pressor changes measures changes in BP in response to a painful stimulus, generated by placing the hand in cold water (2, 9, 10). Since the increase in BP following the cold pressor test is attributed to an activation of the sympathetic nervous system, the decrease in CPR seen in malnourished children in our study, may be suggestive of sympathetic impairment in such children.

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