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Effect of nutritional deficiency on the efficacy of the polio vaccines in Pakistan

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Madam, Undernutrition is quite common in Pakistan.¹ According to World Food Organization, Asia Pacific is the greatest contributor to the global prevalence of undernutrition.² Pakistan has a significant proportion of children suffering from undernutrition because of volatile political, socioeconomic and environmental conditions.² Pakistan is ranked second in the world in terms of total number of wasted children.³

The federal ministry of health has made National Emergency Action Plan 2011 for eradication of polio from Pakistan.⁴ Pakistan is now reporting more polio cases than the combined total cases of three endemic countries i.e. Afghanistan, India and Nigeria.⁴ Understanding the reasons for the failure of polio programme in Pakistan is extremely important otherwise after a few years Pakistan might be the only contributor of polio cases to the world.

Some of the nutrients are important for a normal immune response of the newborn.⁵ Infections resulting from malnutrition increase the severity of malnutrition further, generating a positive vicious cycle.⁵ Most aspects of immune system of the body are affected by undernutrition.⁵ Cell mediated immunity is affected more than humoral immunity.⁶ Severe undernutrition causes atrophy of lymphoid organs, decrease in the bone marrow reserves of leukocyte, decrease in proliferative response of T lymphocytes to antigens, and decrease in natural killer (NK) cell activity.⁶ An important fact is that antibody responses to immunisation with viral vaccines may diminish due to undernutrition.⁶ Protein energy

malnutrition, deficiency of different vitamins and mineral deficiencies effect different aspects of the immune system.⁶

If the nutritional deficiencies are severe enough to affect the immune system of the body, then they will also affect the efficacy of the polio vaccine. An important question that is needed to be explored by the researchers is that whether the nutritional state of the children of polio endemic areas of Pakistan is different from the rest of the country or not? Identification of the specific nutrients which may affect the efficacy of polio vaccine will be an important challenge. National Emergency Action Plan 2011 for polio eradication talks only about the managerial aspects of the polio campaign.⁴ Role of nutritional deficiency is one of the unexplored areas in the context of polio eradication programme in Pakistan. Considering the evidence cited, researchers need to explore this area further to rule out the possibility of nutritional deficiencies affecting the efficacy of the polio vaccines.

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