Kwashiorkor

Acute exacerbation of chronic undernutrition in young children, usually precipitated by infection must have been a worldwide phenomenon over millennia. However, it was only in 1933 that Williams published the first article on kwashiorkor - a syndrome characterized by oedema, dermatosis, diarrhoea and fatty liver. In the next decade there were reports mainly from Caribbean and Sub-Saharan African countries describing malignant malnutrition/infantile beriberi in young children, with high case fatality rates. Indian publications on this entity began in the late 1940s from Madras Medical College (MMC), Madras (now Chennai), and Nutrition Research Laboratories (NRL), Coonoor. The study from MMC Madras was based on hospitalized children energetically treated with diuretics, blood transfusion and antibiotics, and reported a low case fatality rate of only 10%. NRL, Coonoor, christened this clinical entity as nutritional oedema syndrome.

This issue of the Indian Journal of Medical Research (IJMR) carries a classic article, “Kwashiorkor in India”, by C Gopalan and V Ramalingaswamy. Both worked in NRL Coonoor, and each of them later rose to the post of Director-General of the Indian Council of Medical Research and thereby the Editor-in-Chief of the IJMR. In this article, the authors accept the name “kwashiorkor” for this syndrome because of the world-wide usage, and state unequivocally that “kwashiorkor and allied syndromes are but extreme manifestations of one vast global problem common to all underdeveloped regions of the world” - undernutrition in early childhood. Their article reviews the studies carried out by them and their teams over eight years at NRL on nutritional oedema syndrome, defining the aetiology, pathogenesis, clinical definition and management of kwashiorkor in what is today described as primary health care settings; these findings on kwashiorkor are accepted globally and have stood the test of five decades.

The authors reported that, unlike the situation in Sub-Saharan Africa (where children between 1-2 yr of age who were weaned off breast feeding were affected), in India kwashiorkor occurred in older children between 2-3 yr of age who had been chronically undernourished, and was precipitated by infections, mostly diarrhoea. Their studies established that: (i) nutritional oedema syndrome was not infantile beriberi due to vitamin B complex deficiency or malignant malnutrition due to protein deficiency; (ii) it was due to poor feeding practices, mostly with inadequate quantities of adult food with low energy and micronutrient density; consequently, the dietary intake of all nutrients - energy, protein and micronutrients were low in these children; (iii) protein energy deficiency coexisted with micronutrient deficiencies - anaemia, vitamin A deficiency and vitamin B complex deficiency; (iv) management of infection and providing a high-energy and high-protein diet brought about recovery - case fatality rate was below 10 per cent in NRL settings; (v) high-energy, high-protein diets for these young children could be provided by semi-solid calorie-dense food prepared from skimmed milk, banana, and sugar, or roasted cereal, Bengal gram, milk and sugar; these are locally available, relatively low-cost diets and could be provided by the families after the child returns home from school; (vi) the addition of oil to improve energy density was not appropriate, as a majority of these children have steatorrhoea due to poor fat digestion/absorption and also endogenous excretion of fat into the gut; (vii) long-term follow up and care were essential, because relapses were common and many died before the age of 5 yr due to infections; and (viii) there was an urgent need for early detection and effective management of chronic under-nutrition to prevent nutritional edema syndrome.

Research on kwashiorkor continued over the next two decades, mostly at NRL, Coonoor, and later at the National Institute of Nutrition, Hyderabad (when NRL shifted to Hyderabad and was renamed). The research teams found children with kwashiorkor in Hyderabad had a worse nutritional status than those in Coonoor, and that their recovery was slower after intervention. Laboratory studies included further exploration of metabolic, hormonal, biochemical and immune profiles in children with kwashiorkor and in those with chronic undernutrition. Clinical studies included the exploration of the use of defatted groundnut instead of Bengal gram as a source of protein (found not to be useful), exploration of whether the addition of fat (in spite of the majority of the children having steatorrhoeas) would improve calorie density and reduce the duration of hospital stay, and community-based studies on follow up and management of these children. Many of these studies which were of critical relevance to India’s efforts to combat undernutrition in children were published in the IJMR (listed below).

We look back with pride on research studies carried out at NRL/NIN and published in IJMR because these provided the most comprehensive data on all aspects of the disease: aetiology, biochemical and pathological changes in the disease, clinical presentations, and its effective treatment with locally available relatively inexpensive, predominantly vegetarian food in primary health care settings, with emphasis on the importance of strategies for prevention. In India, for the last five decades, clinical care of kwashiorkor follows the guidelines for care provided by NRL/NIN. The emphasis on the importance of early detection and effective management of undernutrition in children below the age of 5 yr led to the initiation of the Integrated Child Development Services (ICDS) in 1975. Kwashiorkor is now rare in India, but this early work is very relevant even today when the country is gearing up ICDS and primary health care systems for prevention, early detection and effective management of severe acute malnutrition and is aiming to achieve complete elimination of severe undernutrition in India.

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