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## SERUM TOTAL CHOLESTEROL AND TRIACYLGLYCEROL IN KWASHIORKOR CHILDREN

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**ABSTRACT:** Serum total cholesterol and triacylglycerol in sixty kwashiorkor children between the ages of 20 and 32 months were estimated. The results obtained showed that 66.7 per cent of the children had total serum cholesterol level below normal range while 43.3 per cent had decreased total serum triacylglycerol level. The decrease in the levels of these parameters in the category of children studied could be a consequence of the biochemical adjustments occasioned by nutrients and energy deficit.

**Key Words:** Serum cholesterol; Serum triacylglycerol; Kwashiorkor; Malnutrition.

### INTRODUCTION

Malnutrition due to various combinations of protein and calorie is by far the most important nutritional problem in the developing countries. Protein energy malnutrition is an all inclusive term, which results from protein and/or calorie deficiency in varying proportions. One of its manifestations is kwashiorkor which is due to deficiency of proteins. Kwashiorkor is prevalent in Asia, Africa, Latin America and part of the Carribean Islands.

Kwashiorkor cannot be said to be caused by an isolated factor, although the major cause can be undoubtedly a low protein and high carbohydrate intake. Several factors have been identified to be predisposing (1). The clinical features of kwashiorkor are a consequence, direct and indirect, of an insufficient supply of amino acids to the tissues which need them for protein synthesis. As a result, there is a failure of function of different organs. This is accompanied by high body water content, loss of fat stores and loss of protein from the wasted muscles and other tissues which greatly alter the chemical composition of the child. Kwashiorkor is also characterized by perturbations in plasma lipid metabolism (2).

In this study, total serum cholesterol and triacylglycerol in kwashiorkor children were estimated.

## MATERIALS AND METHODS

### Subjects

The sera of sixty (60) children with kwashiorkor aged between 20 and 32 months were analysed for total cholesterol and triacylglycerol. The children showed various degrees of oedema. All complied with the Wellcome classification of kwashiorkor (3) and weighed between 60% and 80% of their expected weight for age as compared with the 50<sup>th</sup> percentile of National Centre for Health Statistics (NCHS) standard (4). Informed parental consent was obtained in all cases.

### Methods

Arterial blood was collected and serum was separated by centrifugation at 1,500 x g for 15 minutes. Total cholesterol was measured by an enzymatic iodide method (Cat 14350, Merck, Darmstadt, FRG). Triacylglycerol was determined by enzymatic ultraviolet method (Cat 240052, Boehringer Mannheim, FRG).

## RESULTS AND DISCUSSION

From the results in Table 1, it can be observed that both male and female kwashiorkor children have mean total serum cholesterol below the reference range (90 – 220 mg/ml), but the mean serum triacylglycerol in both male and female is within the reference range (male 60 – 160 mg/dl; female 40 – 120 mg/dl). But in general 33.3% of the children have total serum cholesterol within the normal range, while 43.3% of them had reduced serum triacylglycerol level.

Age (months)	Male		Female	
	Cholesterol (mg/dl)	Triacylglycerol (mg/dl)	Cholesterol (mg/dl)	Triacylglycerol (mg/dl)
20 – 24	64.34 ± 8.04	60.0 ± 7.75	61.67 ± 7.85	48.55 ± 6.96
25 – 29	82.35 ± 9.07	60.55 ± 7.78	76.91 ± 8.78	54.23 ± 7.36
30 – 32	87.0 ± 9.32	78.75 ± 8.87	–	–

These results are in agreement with reports from other workers (5 – 7). Total serum cholesterol and triacylglycerol were found to increase with age and the concentrations are not significantly higher in males than in females. The reduced total serum cholesterol and triacylglycerol concentrations may be due to the inability of the liver to mobilise the lipids (cholesterol and triacylglycerol) as lipoproteins. This may be related to the fatty liver and liver parenchymal cells destruction due to kwashiorkor. The reasons for the decrease in total serum cholesterol and triacylglycerol in kwashiorkor have been reported to be due to age, regional differences, varying body weight and decreased postheparin lipolytic activities (8 – 11).

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