7. Introduction

During the last ten years, treatment of severe acute malnutrition (SAM) has been scaled-up in many countries (1). This is mainly due to the introduction of community-based treatment of SAM, where children without complications can be treated in their homes (2). This approach has huge advantages to the child, to the family, and it means that many more children can now be treated.

However, for children with complicated SAM, treatment has not evolved much during the last fifteen years; and in many treatment centres, these children have mortality rates of 15-40% (3,4).

Infections almost always seem to be involved in the deaths of these children, and a complex relationship exists between infections and malnutrition (5). Part of this may be due to an immune deficiency associated with malnutrition. This immune deficiency has been termed *NAIDS*, Nutritionally Acquired Immunodeficiency Syndrome (6), perhaps as a comment to the attention and resources spent on Human Immunodeficiency Virus (HIV), although NAIDS could arguably be responsible for more deaths globally. However, the nature of this immune deficiency is not well understood. A classical textbook of immunology devote less than half a page to the immune deficiency associated with malnutrition, despite recognizing it to be “extremely common” (7). Although numerous studies have been done, the results often seem conflicting, and confusing.

Another reason for the high mortality may be the lack of understanding about the causes and pathophysiology of severely malnourished children. Particularly oedematous malnutrition is still a true enigma. Finally, the physiological changes induced by refeeding may render malnourished children particularly vulnerable during the transition from catabolism to anabolism; but the nature of his vulnerability is not well understood either.

The aim of this PhD thesis is to identify and discuss some possible factors involved in the vulnerability of children receiving inpatient treatment for SAM. The specific objectives are:

- to systematically review the scientific literature about immune function in children with malnutrition
- to investigate physiological changes occurring during in-patient refeeding of children with SAM, specifically:

- to identify correlates of thymus size on admission, and predictors of change in thymus size during treatment
- to identify correlates of oedema in SAM
- to identify risk factors for death during hospitalisation.