Immune status of infants fed soy-based formulas with or without added nucleotides for 1 year: Part 2: Immune cell populations


**Introduction**

Term infants fed soy protein-based formula for the first year have responses to immunizations similar to those of infants who are fed human milk, but cellular aspects of immunologic development of soy-fed infants are relatively unknown. This paper investigates the cellular aspects of immunologic development in soy-fed infants.

**Study Purpose**

- The purpose of this study was to evaluate immune cell population of full-term, healthy infants fed soy protein-based formula with or without added nucleotides during the first year. A reference group of infants fed human milk/cow milk-based formula was also included.

**Study Design**

Using data from a masked, 12 month feeding trial by Lasekan et al.,

3  
the authors looked at cellular immune status as determined by immune cell populations. Formula-fed infants in this study were randomly assigned to one of two groups:

1) Infants fed soy protein-based formula (n=92) (SOY)

2) Infants fed soy protein-based formula with 74 mg added nucleotides/L (n=94) (SOYN)

A non-randomized group of infants fed exclusively human milk for at least 2 months and human milk and/or milk-based formula without added nucleotides (HM/F) was also included (n=81)

This longitudinal study characterized 32 populations of immune cells from HM/F and soy-based formula-fed infants using three-color flow cytometry at 6, 7, and 12 months of age. Specific cellular markers were chosen to assess general pediatric immune status with an emphasis on maturation and activation of B (humoral, or antibody-producing immune response cells), T (cell-mediated immune response cells), and NK (‘natural killer’ cells—white blood cells that play a major role in the rejection of tumors and cells infected by viruses) lymphocytes.

Soy protein-based formulas are naturally rich in polymeric nucleotides. Research study results have shown that infant immune status can be improved by adding monomeric nucleotides to infant formulas.¹,² It is not known whether polymeric and monomeric nucleotides differ in their immune-stimulatory effects in young infants.
Study Results

Of the 267 infants enrolled, a total of 213 infants successfully completed the study (73 SOY, 73 SOYN, 67 HM/F). All immune cell populations were within age-related normal ranges for both number and percentages. Although the values were within normal ranges, there were some significant differences at some time points between the infants fed soy formula, particularly SOYN, and the HM/F infants in the populations of some cell types. No response differences were observed between infants fed SOY and those fed SOYN; however, SOYN tended to increase numbers and percentages of T cells and decrease numbers and percentages of NK cells within the population.

Discussion

This study compares antibody responses and immune cell status of HM/F-fed infants and those fed soy protein–based formula. Few differences were demonstrated between soy-based formula-fed and HM/F-fed infants.

Study Conclusions

No indication of any consistent difference in immune status, maturation, or level of immunocompetence among infants fed a soy-based formula was noted. Nucleotide supplementation of the soy protein-based formula did not have a significant or strong effect on the immune status of the infants.

References


Key Points:

- Infants fed the commercial soy protein-based formula (Isomil) had immune cell status similar to infants exclusively breast-fed for at least the first 2 months of life, and this was consistent with normal immune system development.
- The addition of nucleotides to soy protein-based formula did not significantly change specific individual immune cell populations.