Calcium and Vitamin D Intake in Children with Perceived Atopic Disease Versus Healthy Children and Corresponding Parental/Caregiver Attitudes Towards Dairy Products

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Objectives and Hypothesis

- Determine if atopic and non-atopic children are meeting daily recommended intakes of calcium and vitamin D from food or supplements
- Explore behaviors and beliefs of parents/caregivers (PCs) about milk and dairy products

Hypothesis: Children with atopic disease are not consuming adequate calcium and vitamin D, due in part to negative parental beliefs towards milk and dairy products.

Background

- Milk and dairy products (MDPs) are increasingly perceived to be deleterious to health and are declining in popularity.
- Appropriate consumption of MDPs protects effects against osteoporosis and fracture. These nutrients are difficult to substitute in adequate amounts with the standard American diet.
- Lactose intolerance, common in older and non-White populations, and milk allergy, most prevalent in infants and young children, are common concerns impacting MDP intake.
- Overestimation of milk allergy is common. Parents may mistake coincidental gastrointestinal illness or other condition for milk allergy. Indiscriminate use of IgE testing by consumers also contributes to misdiagnoses.
- Identification of true milk allergy is important to avoid unnecessary dietary restrictions which decrease quality of life and increase risk of nutritional deficiencies.

Methods

- A previously validated food frequency questionnaire (FFQ) and belief survey were administered to 220 parents/caregivers (PCs) of children aged 3-13 years.
- Atopic Group: 110 PCs of children with a diagnosed atopic disease (allergic rhinitis, asthma, food allergy, and/or atopic dermatitis) receiving care at an outpatient allergy clinic.
- Non-Atopic Group: 110 PCs of children without atopic disease and chronic healthcare problems that could impact dietary intake (ex. non-atopic chronic inflammatory diseases, cystic fibrosis, cancer, eating disorders, etc.) receiving care at an outpatient general pediatrics clinic.
- Subjects were selected consecutively. A member of the research team informed PCs of the study, obtained verbal consent, and remained with the PCs to address questions as they completed the survey.
- Calcium and vitamin D intake were calculated from FFQ responses and compared to NIH recommended daily intake for the child’s age.
- Data were analyzed for differences between atopic and non-atopic groups across demographic information, PCs’ behavior and attitude towards MDPs and frequency of sufficient calcium and vitamin D intake using chi-square analyses (α = 0.05).

Results

- 77.3% of non-atopic and 51.8% of atopic children meet the daily recommended calcium intake (p<0.001).
- The ratio of FFQ-calculated calcium intake to daily recommended level is 1.25±0.08 in the non-atopic and 1.88±0.13 in the atopic group (p<0.001) indicating that average intake nears the daily recommendation in both groups.
- A significantly larger percent of calcium intake in the atopic (7.6% of daily intake) versus non-atopic (1.9% of daily intake) group is from supplements (p=0.001).
- Both groups have inadequate vitamin D intake—82.7% of non-atopic and 87.3% of atopic children do not meet the daily recommended intake level (p=0.345).

Discussion

- Neither the atopic nor non-atopic groups completely meet the daily recommended calcium and vitamin D intake levels.
- The non-atopic group performs better in calcium consumption than the atopic group.
- Both atopic and non-atopic groups have poor consumption of vitamin D.
- Parents/caregivers (PCs) of atopic children have more negative beliefs about milk and dairy products (MDPs) in their child’s diet (93.6% vs. 83.6%, p=0.010) and believe intake of these products is important (94.0% vs. 81.7%, p=0.009).
- 21.7% of PCs of atopic versus 2.0% of PCs of non-atopic children believe their child is allergic to MDPs (p=0.003).
- 3 children in the atopic group (2.7%) have physician-diagnosed IgE-mediated milk allergy.
- When the 3 children with diagnosed milk allergy were excluded from analysis, results for calcium and vitamin D intake and PCs' beliefs did not change significantly.

Conclusion

- Neither the atopic nor non-atopic groups completely meet the daily recommended calcium and vitamin D intake levels.
- The non-atopic group performs better in calcium consumption than the atopic group.
- Both atopic and non-atopic groups have poor consumption of vitamin D.
- Parents/caregivers (PCs) of atopic children have more negative beliefs about milk and dairy products (MDPs) and are less likely to include them in their child’s diet than PCs of non-atopic children. They also overestimate the likelihood of milk allergy.
- Non-atopic and atopic children are at risk of insufficient calcium and vitamin D intake.
- Further investigation is needed to determine extent of PCs’ nutritional knowledge and define negative beliefs PCs have regarding MDPs.

References

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Figure 1. Demographic Information of Subjects.

Figure 2. Parent and Caregiver Beliefs About Milk and Dairy Products.

Figure 3. Calcium and Vitamin D Intake.

Figure 4. Percentage of Respondents who Meet the Daily Recommended Calcium and Vitamin D Intake.

Figure 5. Parent and Caregiver Beliefs About Milk and Dairy Products.

Figure 6. Comparison of calcium and vitamin D intake of children with perceived atopic disease versus healthy children.