COW'S MILK SENSITIZATION: RELATION TO SKIN ALLERGY

Thesis
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Marwa Taher

Table of Contents

List of Abbreviations

Abb.	Full term
AAF	Amino acid formula
AAP	American Academy of Pediatrics
AD	Atopic dermatitis
A-LA	Alpha-lactalbumin
APC	Antigens presenting cells
BA	Bronchial asthma
BLG	Beta-lactoglobulin
BSA	Bovine serum albumin
CM	Cow milk
CMA	Cow milk allergy
CMP	Cow milk protien
DBPCFC	Double blind placebo controlled food challenge
EAI	Epinephrine auto-injectors
EFA	Essential fatty acids
eHF	Extensively hydrolysed formula
ELISA	Enzyme-linked immunosorbent assay
EoE	Eosinophilic esophagitis
EPIT	Epicutaneous patch
EPT	End point test
ESPGHAN	European Society of Pediatric Gastroenterology, Hepatology and Nutrition
FAHF	Food allergy herbal formula
FPIES	Food protein-induced enterocolitis syndrome
GERD	Gastroesophageal reflux disease
HDM	House dust mite
IgE	Immunoglobulin E

Abb.	Full term
IQR	Interquartile range
OFC	Oral food challenge
OIT	Oral tolerance induction
PAF	Platelet-activating factors
PEF	Peak expiratory flow
PPT	Prick-prick test
PPV	Positive Predictive value
PUFAs	Polyunsaturated fatty acids
RCT	Randomized controlled clinical trial
RSAT	Radioallergo sorbent test
SD	Standard deviation
sIgE	Specific IgE
SPT	Skin prick test
TH2	T helper cells
Tregs	T regulatory cells
UHT	Ultra high temperature
UK	United Kingdom
WHO	World Health Organization
α-gal	Galactose-α-1,3-galactose

List of Tables

List of Figures

Introduction and Aim of the Work

Introduction

Food allergies are most prevalent in children, particularly in infancy and pre-school age. A number of clinical signs are involved in food allergies ranging from mild cutaneous symptoms to life-threatening anaphylactic reactions **(Wang and Sampson, 2009; Sicherer and Sampson, 2010).**

Although any food protein can induce an allergic reaction, just a relatively limited number of foods are responsible for the majority of food hypersensitivity reactions in children worldwide **(Rancé et al., 1999; Rona et al., 2007).**

Cow's milk allergy (CMA) is a complex and often misunderstood disorder. In CMA, the immune system is incorrectly programmed to react to innocuous milk proteins. In most people the immune system is able to recognize the milk proteins as harmless and tolerate them. However, in allergic individuals the immune system becomes sensitized to the milk proteins and mounts a damaging inflammatory response **(Halken, 2004).**

Cow's milk is the most frequently encountered dietary allergen in infancy when the immune system is relatively immature and susceptible to sensitization from environmental

antigens **(Wood, 2003).** Cow's milk allergy is most prevalent in early childhood, with figures generally reported between 2 and 6 % **(Hill et al., 1997; Garcia-Ara et al., 2004).**

Allergies to milk are often broadly classified into immunoglobulin E (IgE)-mediated allergy and non-IgE-mediated allergy. The immunopathological mechanisms of non-IgE-mediated allergy in particular remain poorly understood, and this has hindered the development of simple and reliable diagnostic tests **(Hill et al., 1997; Eigenmann and Frossard, 2003).**

Skin prick test is useful to establish the presence of IgE sensitization to food. The presence of allergen specific IgE on cutaneous mast cells results in a positive skin test in the form of a transient "wheal-and–flare" reaction **(Kiecolt-Glaser et al., 2009).**

Skin prick test is highly sensitive but only moderately specific in regard to clinical reactivity. The positive predictive accuracies of skin prick test are less than 50%. On the other hand, negative predictive accuracies of skin prick test are more than 95%, and are therefore useful for confirming the absence of an IgE-mediated reaction **(Gerez et al., 2010).**

Aim of the Work

We sought to investigate the frequency of cow's milk sensitization and allergy in a group of Egyptian children with atopic dermatitis and acute urticaria as a pilot study to be followed by a series of relevant studies in various age groups and locations. The ultimate objective is to estimate the magnitude of the problem in our country and its influence on the manifestations and course of illness.

Review of Literature

Review of Literature

Food allergy is the consequence of maladaptive immune responses to common and otherwise innocuous food antigens **(Vassallo et al., 2010).** The most common allergenic foods are cow's milk and dairy products, hen's egg, peanuts, nuts, gluten containing cereals (e.g., wheat, rye and barley), sesame, soybeans, mustard, fish, crustaceans and shellfish **(FAO/WHO, 1998; Špičák, 2010).**

In 2007, the World Health Organisation (WHO) formally acknowledged that allergy has become the No. 1 environmental epidemic disease facing children of the developed world **(World Health Organisation, 2007)**, with an incidence rate of 2%–3% in the first year of life **(Host, 2002).**

Cow's milk allergy (CMA):

Milk is processed into a variety of dairy products such as cream, butter, yogurt, kefir, ice cream, and cheese **(Curry, 2013).**

The reported prevalence of CMA in infants and adults varies between studies, in part due to the difficulties in accurate diagnosis, differences in the age of study populations, and the clinical assessment criteria used **(Hill et al., 1997; Garcia et al., 2004).** Childhood CMA is reported to be more prevalent in boys

(Ngamphaiboon et al., 2008). It is the most prevalent food allergy in the first year of life and may affect 2% to 6% of infants and 0.5% to 1% of adults **(Caffarelli et al., 2010).**

In Europe

UK data from 2008 indicated 2.3% of 1–3 year olds suffer from CMA **(Venter et al., 2008)**. A meta-analysis by **Rona et al. (2007)** reported that CM is one of the most common foods responsible for allergic reactions in European children **(Venter and Arshad, 2011)**. In a Danish study of 1,749 newborns followed for 12 months, 39 (or 2.22%) were confirmed allergic to CM **(Høst, 2002).** In a study from Finland 6,209 newborns followed for 15 months, 118 (1.9%) had positive Double-Blind, Placebo-Controlled Food Challenge **(**DBPCFC) **(Saarinen et al., 1999).** A pan-European survey estimated milk as the most frequently reported offender in children (38.5% of reports) and the second in adults (26.2%) **(Steinke et al., 2007).** In France, 29/182 school aged children with reported food allergy were milk-allergic in 11.9% of cases **(Rance´et al., 2005).**