Paris, 23 March 2006 - Georges MOUTON MD

MILK AND DAIRY THREATS

A difference should be made between food allergy and **food intolerance**. The latest "may be defined as a reproducible adverse reaction to the ingestion of a food or to any of its components" by opposition to **food allergy**, which "may be defined as an adverse clinical reaction to a specific food component and that is immunologically mediated" [1].

"Adverse reactions to cow's milk should be differentiated into immunologic (**cow's milk allergy**) and non immunologic (**cow's milk intolerance**)" [2]. "The most common cause of cow's milk intolerance is lactase deficiency" [2], which leads to **lactose intolerance**. "It has high racial predilection, being highest in dark-skinned populations and lowest in northern Europeans" [2]. Besides, "allergic reactions to cow's milk are driven by more than one immunological mechanism" [3], leading to the distinction between **IgE** and **IgG allergies**.

"The incidence and dominant allergic mechanisms change with age, with IgE-mediated reactions common in infancy and non-IgE-mediated reactions dominating in adults" [3]. These mostly imply IgG antibodies and delayed reactions. We must consider that "cow's milk allergy is a complex disorder" [3]. Indeed, "**numerous milk proteins** have been implicated in allergic responses and most of these have been shown to contain **multiple allergenic epitopes**" and "there is considerable heterogeneity amongst allergic individuals for the particular proteins and epitopes to which they react" [3]. Most abundant milk proteins are **caseins** and whey proteins called **alpha-lactalbumin** and **beta-lactoglobulin**.

Patients with cow's milk allergy often have morphologic changes in their gut epithelium enabling enhanced antigen translocation directly through **leaky tight junctions** [4, 5]. Cow's milk antigens may trigger the development of **auto-immune diseases** such as type I insulin-dependent diabetes. Such patients have an increased immune reaction towards certain milk proteins [6] and several authors underline the relationship between early cow's milk exposure and the development of **type I diabetes** in humans [7, 8].

"The cows' milk hypothesis for (…) insulin-dependent diabetes is based on the concept that early consumption of cows' milk may expose the immune system to a foreign protein possessing immunological cross-reactivity with an antigen present on pancreatic beta-cells" [9]. Indeed, "sequence homologies exist between **beta casein** and several beta-cell molecules" [9]. High antibodies to beta-casein are also seen among **cœliac patients** [10].

The early introduction of formula feeding in replacement of breastfeeding, i.e. during the first trimester, results in increased cow's milk protein IgG antibodies and in the development of allergic reactions [11], but "**breastfeeding** within the first 4 months of life prevents the generation of antibody response to bovine beta-casein" [12].

Allergic patients who should avoid cow's milk proteins might not tolerate hydrolyzed formulas [13], even though an extensively hydrolyzed **whey** formula could be tried [14]. It seems that using a **soy** formula can be effective [14] and safe [15]. Other alternatives can be employed: a **rice** hydrolyzed formula [16,17], **almond** milk [18] or **horchata de chufa**.

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