



Can Dietary Manipulation Cure Crohn's Disease?



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Abstract

In isolated cases of Crohn's disease, dietary manipulations have produced what biologics and steroids have yet to document, permanent remissions/cures. The postulate introduced is that permanent remissions achieved through dietary manipulation are achieved by marked reduction of MAP antigen/pre-primed antibody interactions and by dietary immune system restoration/enhancement that may result in the destruction of the MAP-template driving the dysfunctional pro-inflammatory immune response.

Keywords: Crohn's disease; Dietary manipulations; Mycobacterium avium; Gastrointestinal microbiota; Zinc deficiencies; Antioxidant effect; Vitamin C; Minerals; Amino acids

Crohn's Disease is a Zoonotic Food-Borne Disease

Mycobacterium avium subspecies paratuberculosis (MAP) is a significant pathogen for milk-producing domestic animals. Infected animals have the ability to shed the mycobacterium into their milk [1,2]. MAP survives pasteurization [3,4]. USDA's failure to address the growing prevalence of MAP in dairy herds has resulted in widespread dissemination of the mycobacterium particularly within milk-based food products [5]. MAP has been identified in infant formula, powdered milk, milk, cheese, etc [6-13].

In contrast to their pathogenicity as replication pathogens in domestic animals, MAP and other atypical mycobacteria have limited pathogenicity for humans unless congenital or acquire immunodeficiency is present [14,15]. At birth, newborn infants lacking acquired immunity are analogous to a germ-free animal. Acquired immunity is central to establishing immunological governance over viral and mycobacterial infections. The Hruska postulate introduced the concept that, if a newborn becomes infected with MAP in its period of immunological vulnerability, the ability of its inherent immune system to abort mycobacterial replication could be severely challenged [16]. Depending on the baby's genetic profile, the magnitude of the infectious MAP inoculum, and the status of its developing acquired immunity, the baby's inherent immune system can become so taxed that its TH1 pro-inflammatory response to MAP becomes fixed within immunological memory. Whenever the body is again presented with MAP's antigenic array, rather than responding by exhibiting immunological tolerance, immunity re-initiates its original pro-inflammatory cytokine

responses and attacks MAP at its site of attachment and antigen processing. Fecal stasis concentrates MAP challenges in the ileocecum. The focal destruction of the gastrointestinal mucosa allows for penetration of the gastrointestinal microbiota into the lamina propria and underlying tissues [17,18].

Dietary Exclusion Therapeutic

Things happen for a reason. Isolated unstructured observations without implied mechanism of action are rarely published in the medical literature. Most cases of permanent resolution of Crohn's disease through dietary manipulation are found in the lay literature. What is in the medical literature is the demonstration that dietary use of specific carbohydrates (the SCD diet) can produce demonstrable clinical amelioration in cases of pediatric Crohn's disease [19,20]. While the SCD diet improved mucosal inflammation, healing could not be documented [21,22].

Central to re-establishing mucosal integrity is aborting antigen/antibody cytotoxicity at MAP's sites of mucosal attachment. The pathogenesis of Crohn's disease argues for the removal from diet of all foods that have the potential of having been adulterated by MAP, more specifically all dairy based products and red meat. By so doing, the number of cytotoxic antigen/antibody interactions within the gastrointestinal tracts are markedly reduced. Biologics act by dismantling the cytotoxic cytokine response to MAP. Dietary exclusions utilize prevention of, rather than immune response interference to achieve the same objective, reconstitution

of mucosal integrity. Being nearly impossible to identify and/or eliminate all MAP adulterated foods, dietary exclusion and biologics are complementary to each other in re-establishing mucosal reconstitution.

Dietary Supplementation Therapeutics

How individual dietary constituents influence host immunity is well documented in the medical literature. In Crohn's disease, the induced alterations of gastrointestinal structure and function compromise the quantitative availability of vitamins, minerals and selected amino acids essential to effective immune system function.

Minerals

Zinc is a prime example of how deficiency of a single mineral can undermine immune system integrity. The body has no specialized system to store zinc [23]. Individuals with Crohn's disease will have zinc deficiency impairment affecting a broad spectrum of immune mechanisms owing to decreased absorption and increased exogenous loss [24]. Individuals with a diarrheal disease will have high fecal loss. Zinc is important to the catalytic activity of approximately 100 enzymes involved with immune system function and DNA synthesis [25]. Zinc deficiencies result in adverse changes in cytokine production and T-cell subpopulations [26]. A side effect of zinc deficiency is anorexia which in itself can create a negative feedback.

Vitamin

The vitamin C and E interactions are central to immune system maintenance. Vitamin C regenerates vitamin E from its oxidized form. The lipid soluble antioxidant vitamin E not only protects the integrity of cell membranes, but functions synergistically with other nutritional elements that beneficially influence cell-mediated immunity. The salvage of vitamin E influences the immune functions of selenium which in turn has a beneficial impact on copper and zinc utilization.

Like zinc, vitamin C has limited storage within the human body. Through its antioxidant effect, vitamin C plays a central role in the containment of mycobacteria [27]. The body's need for vitamin C dramatically increases with infection/disease [28].

Destruction of the Map Immune Template

The reason for acute therapeutic focus on vitamins, minerals, and amino acids central to maintenance of optimal host immunity is the postulate that the curing of Crohn's disease is contingent upon destruction of the MAP templates (spheroplasts) sustaining the dysfunctional immune response that is characteristic of Crohn's disease.

The evidence relating to destruction of the MAP template through specific enhancement of host immunity is derived in part from a four-month study of a cow with near terminal Johne's disease. In an attempt to prolong her life in order to collect high-ti-

ter anti-MAP serum, a specialized diet was designed that targeted enhancement of cellular immunity. When finally necropsied four months later, the cow had regained all her body weight. The serological markers for MAP infection had dropped to near normal status. No gross or histological evidence of Johne's disease could be identified [29]. Evidence of acid-fast bacilli in diseased tissue was totally absent. What was present was a clue as to how the body can actually destroy mycobacteria [30]. The significance of this observation, which was supported by field trials in diseased animals, provided insight as to how dietary manipulation had, more likely than not, attained permanent remissions [31].

A secondary substantiation of MAP spheroplasts driving the dysfunctional proinflammatory immune-mediated response comes from the only other therapeutic regimen that has produced isolated cures of Crohn's disease: anti-mycobacterium drugs [32-37]. As a general rule, anti-tuberculosis drugs have not produced cures. When they have, the mechanism of action of one or more of the compounds used involved disruption of RNA function. For an antibiotic to destroy bacteria without a cell wall (spheroplasts), the drug must act on the organism's ribosomes.

Why Dietary Manipulation Can Fail

Crohn's disease is the consequence of two inter-related but separate disease processes; a dysfunctional immune-mediated response to MAP's antigen array and polymicrobial bacterial invasion of small bowel by the gastrointestinal microbiota [38]. Failure to appropriately negate the latter through comprehensive antibiotic therapy will produce the late sequela of Crohn's disease: strictures, loop-to-loop anastomoses, peri-anal fistula, bowel perforations, etc. [39-40]. Once in place, the curing of Crohn's disease may require surgical intervention.

Dietary Manipulation's Risk-Benefit Ratio

To date, there is still no test that distinguishes human MAP infection from Crohn's disease. Delay in commitment to therapy enhances the potential for structural damage to the ileocecum. Dietary manipulation is a therapeutic tool with literally no indefinable adverse consequence whose end-titration point is contended to be cure destruction of the MAP templates.

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