EC Nutrition Editor's Column - 2016

Good + Good = Better?

"There is a distinct lack of rigorous and systematic experimental evidence to justify why and how a number of distinct nutrients could be combined or formulated into an immuno-nutrition formula, as information regarding potential synergistic or antagonistic interactions between individual therapeutic nutrients is quite limited"

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COLUMN ARTICLE

The published literature examining the therapeutic potential of therapeutic nutrition in critical illness setting is beset with controversy and conflicting results [1]. One of the most controversial aspects of therapeutic nutrition formulas is often combinations of a number of distinct nutrients are included in the same preparation on the prevalent assumption that additivity or even synergism will be achieved by combining different nutrients that are beneficial on an individual basis. The clinical benefits of these individual components have been studied in a relatively extensive manner, yet information regarding potential synergistic or antagonistic interactions between individual therapeutic nutrients is quite limited.

In the majority of clinical trials on therapeutic nutrition in a variety of clinical settings (e.g., sepsis, trauma, burns and cancer), various formulas featuring the combinations of different nutrients are used. However, there is a distinct lack of rigorous and systematic experimental evidence to justify why and how nutritional constituents in these therapeutic nutrition products are combined or formulated.

In our previous research endeavors [2], we explored the therapeutic potential of glutamine and *n*-3 PUFAs as individual parenteral supplements on cardiotoxicity and anti-tumor efficacy related to chemotherapy in a clinically relevant model featuring breast cancer and doxorubicin chemotherapy. In addition, we further explored how the higher order of interaction between glutamine and *n*-3 PUFAs would affect tumor and host response to doxorubicin chemotherapy. Of note, these two nutrients seem to be antagonistic on a number of heart and tumor-related endpoints. These findings were echoed by our previous study on a colon-tumor model treated with 5-FU/CPT-11 chemotherapy [3], in which we also demonstrated that individual benefits associated with single supplementation of glutamine or *n*-3 PUFAs, were partially or completely lost when these two nutrients were combined.

Additivity or even synergy between dietary factors would be predicted if their mechanisms of action are relatively exclusive. On the other hand, if all the factors are suggested share one principal mechanism of their action, dietary intervention with the combination of these factors may be redundant and they may demonstrate very little incremental activity when administered together. This is the overall principle for predicting potential interaction between different nutritional factors. Nonetheless, emerging evidence suggests that the therapeutic effects of these combined nutrients are dose and end point-dependent, and may also rely on the nature of disease, severity of the illness, timing and duration [4,5,6]. Systematical research efforts are surely warranted to understand potential nutrient-nutrient interactions and their role in the complex immuno-pathological situations associated with different clinical settings.

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