Pediatr. Res. *15:* 168 (1981)

Letter to the Editor: Picolinic Acid in Human Milk

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To paraphrase the last sentence of the next to last paragraph in the letter of Hurley and Lönnerdal, the ability of a substance to bind zinc in human milk does not mean it plays a normal physiologic role in absorption. The experiments of the Davis group suggest that zinc in human milk as it comes from the breast is bound to high-molecular-weight proteins and citrate. We do not question this observation. However, experiments of this nature give no indication of what happens in the gastrointestinal tract after the proteins and other milk constituents (including citrate) become metabolized. We have proven that picolinic acid is present in human milk and have also proven that this ligand facilitates zinc absorption (1–3). Thus, we have suggested that the picolinic acid in human milk forms a complex with zinc and facilitates absorption of zinc. Hurley and Lönnerdal continually attack this hypothesis, but they have never attempted to actually isolate and quantitate picolinic acid in human milk.

Hurley and Lönnerdal attempt to discredit our quantitation method by suggesting that it is nonspecific. If the Davis group and other doubting readers will carefully examine our publication, they will realize that the milk was subjected to ultrafiltration, ion-exchange chromatography, and gel-filtration chromatography before the optical density was determined. As shown in our publication, mass spectroscopy, infrared spectroscopy, and thin-layer chromatography were used to prove that this technique completely separates picolinic acid from all other components of the milk. Thus, we did not read the optical density of several aromatic metabolites as suggested by Hurley and Lönnerdal.

The arguments regarding the relative concentrations of tryptophan, nicotinic acid, and picolinic acid in milk do not in any way weaken our hypothesis. Inasmuch as picolinic acid is a metabolite of tryptophan, one would expect to find a lower concentration of free tryptophan. The concentration of nicotinic acid in milk probably depends upon nutriture, and our samples were from healthy North Dakota women. To reiterate, Hurley and Lonnerdal continually attempt to discredit our results, but they have never attempted to quantitate picolinic acid in human milk.

Having finally recognized the fact that picolinic acid is a potent chelating ligand that does facilitate zinc absorption, the Davis group then try to discourage its use. They state that picolinic acid is an irritant and include as a reference only "Merck Co." Just exactly what level of picolinic acid is irritating, and exactly what is meant by an irritant? We are indeed carefully evaluating the safety and efficacy of zinc picolinate in several children with acrodermatitis enteropathica. The results obtained to date are extremely promising.

REFERENCES AND NOTES

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0031-3998/81/1502-0168$02.00/0

Printed in U. S. A.