Dear Sir,

We read with great interest the paper by Klek and coworkers\(^1\) about safety and efficacy of SMOFlipid in adult patients requiring long-term parenteral nutrition (PN). SMOF is a complex mixed emulsion of 20% lipid containing 30% soybean oil, 30% MCT, 25% monounsaturated fatty acids, and 15% fish oil. The rationale for this composition was that it was believed to be more comparable with the varied fat composition that would have been present in food available during the course of human evolution and consequently may be regarded as optimal.\(^2\) SMOF could have important liver protecting properties\(^2\) as showed by a randomized trial in adults undergoing major surgery, in which the use of SMOF was associated with lesser disturbances to liver enzymes if compared with a soybean oil-based emulsion.\(^3\) For this reason, in August 2011, we began a practice in our Unit of changing the lipid intake from Intralipid or Clinoleic to the varied fat composition that would have been present in food available during the course of human evolution and consequently may be regarded as optimal.\(^2\) SMOF could have important liver protecting properties\(^2\) as showed by a randomized trial in adults undergoing major surgery, in which the use of SMOF was associated with lesser disturbances to liver enzymes if compared with a soybean oil-based emulsion.\(^3\) For this reason, in August 2011, we began a practice in our Unit of changing the lipid intake from Intralipid or Clinoleic to

Figure 1. A) November 2011. Before starting SMOF. (B) Three months after started SMOF. Complete disappearance of the gallstones.
SMOF in any child who could have potential life-long or irreversible dependence on PN and therefore at high risk of developing liver disease. Thus we are using SMOF in patients with congenital mucosal defects, short bowel syndrome (SBS) with remaining intestinal length $\leq 20$ cm and motility disorders. Since August 2011 we switched to SMOF six patients previously treated with Intralipid: three out of them were affected by microvillous inclusion disease, two by SBS and one by long-segment Hirschsprung disease. Surprisingly in two patients, both affected by microvillous inclusion disease, the use of SMOF resulted associated with some changes of the gallstones in the gallbladder. One patient experienced a total disappearance of the gallstones after three months he was started on SMOF (see Fig. 1). The second patient showed a reduction of the gallstone size from 1.5 cm to 0.9 cm after two months of SMOF infusion. Both the patients received ursodeoxycholic acid at 15 mg/kg/day that remained unchanged after they started SMOF.

The main difference between Intralipid and SMOF that could justify this effect is the ratio of $\omega$-6 to $\omega$-3 that is 7:1 and 2.5:1 respectively. The increased content in $\omega$-3 fatty acids in biliary phosphatidylcholines seems to reduce the super-saturation with cholesterol and to prevent the precipitation of cholesterol crystals in bile. This finding may support the use of SMOF in patients on total PN who are at high risk of developing gallstones but it is not sufficient to explain the vanishing of the gallstones as in our cases. Further prospective studies are required to assess if the disappearance of the gallstones is a coincidental association or a true effect of the SMOF.

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AD: conceived of the study and participated in its design and coordination.
REP: collection of data and helped to draft the manuscript.
FP: collection of data and helped to draft the manuscript.
All authors read and approved the final manuscript.

Conflict of interest
There is no conflict of interest that authors should disclose.

References

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