

BIOLOGICAL AND CLINICAL ASPECTS OF AN OLIVE OIL-BASED LIPID EMULSION – A REVIEW

Olive oil-based ILE appears to support the innate immune system, is associated with fewer infections, induces less lipid peroxidation, and is not associated with hepatobiliary or lipid disturbances.

REVIEW SUMMARY

The narrative review of 115 articles summarizes the evidence for the effects of olive oil-based intravenous lipid emulsion (ILE). Specifically, summarized are the effects on:

- Immune Function
- Lipid Peroxidation
- Plasma and Lipid Glucose Metabolism
- Hepatobiliary and Endothelial Function
- Morbidity and Mortality

In the largest randomized control trial to date (N=458), olive oil-based ILE was clearly associated with fewer infections compared to a soybean oil-based ILE⁷

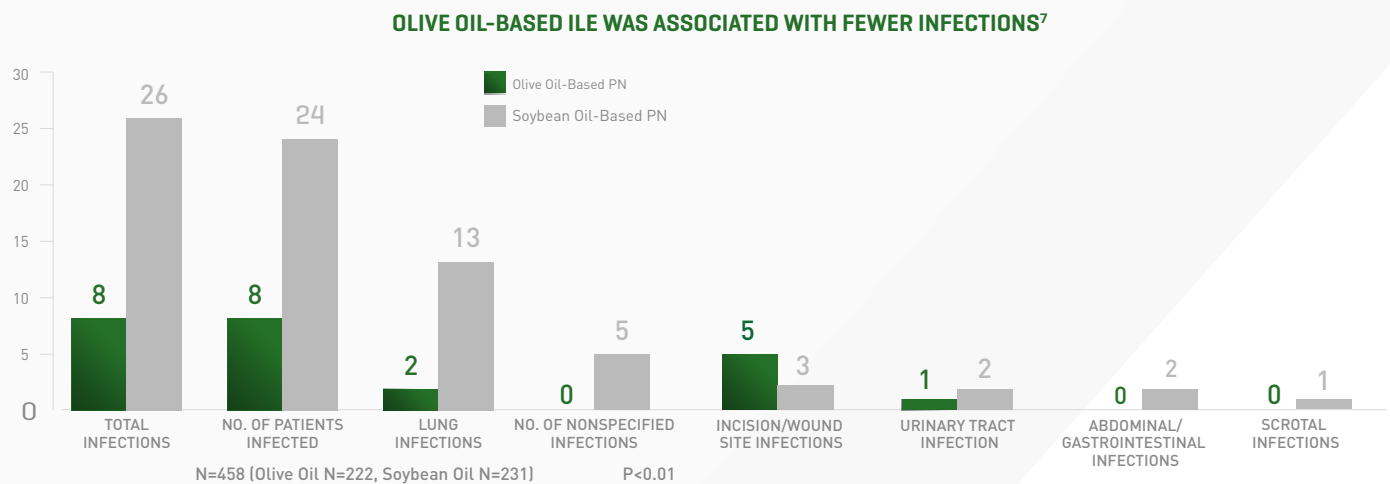


RESULTS

Collective evidence from animal studies, in vitro cultured immune cell studies, and clinical studies suggests that olive oil-based ILE appears to preserve immune function.

OLIVE OIL-BASED ILE MAY PRESERVE IMMUNE FUNCTION

- Olive oil-based ILE has beneficial effects on immune cell proliferation and function and/or immune cell death¹⁻⁴
- Olive oil-based ILE has lesser effects on disruption of bacterial clearing compared with other ILEs^{5,6}
- Olive oil appeared to be more neutral in its effect on inflammatory eicosanoid or cytokine production compared with other ILEs^{9,10}



OLIVE OIL-BASED ILE LIMITS LIPID PEROXIDATION

- Olive oil and its primary constituent, oleic acid, was associated with less lipid peroxidation compared with other ILEs. Most studies have not reported a difference in oxidative stress markers between ILEs. ^{9,11,12}

OLIVE OIL-BASED ILE MAY HAVE BENEFICIAL EFFECTS ON CHOLESTEROL LEVELS

- Olive oil-based ILEs are safe and have limited effects on lipid profiles when used for long-term PN^{14,17}

OLIVE OIL-BASED ILE IS NOT ASSOCIATED WITH ADVERSE EFFECTS ON THE HEPATOBILIARY SYSTEM

- While statistically significant differences between olive oil-based ILE and other ILEs were noted in many studies, the majority of studies reported hepatobiliary functional markers that were within normal limits or 1.5 X ULN. These differences between ILEs should be interpreted with caution as they may not be clinically important. ^{8,13,17-21}
- Most studies in adults, preterm neonates, and children suggest that olive oil-based ILE is safe and not associated with adverse effects on hepatobiliary function.⁷

OTHER OUTCOMES

- Studies indicate that there is no meaningful difference among ILEs in glucose metabolism, morbidity and mortality^{15,16,18,22,23}

A literature review of 115 English-language studies found olive oil-based intravenous lipid emulsion is well tolerated and provides effective nutritional support to various parenteral nutrition-requiring populations.

Olive oil-based ILE may support the innate immune system, is associated with fewer infections, induces less lipid peroxidation, and is not associated with increased hepatobiliary or lipid disturbances.



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