**Supplemental Table 1** Characteristics of selected studies.

| Author, year | Location | Design | No (I/C) | Age (I/C) (year) | Operation | Brand name of lipids | Duration (day) | Dose (day) | Control group | Time of tested blood (day) | Adjustments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Zhu, 2013 [47] | China | RCT | 33/33 | 48.62/51.52 | Liver Transplantation | Omegaven | 7 | 2ml/kg | PN without supplementation of ω-3 fatty acids | 2 | Age, sex, Child Pugh classification of hepatic function, operation duration, anhepatic phase, and postoperative immunosuppression therapy |
| Wang, 2011 [49] | China | RCT | 41/41 | 51.93/58.13 | Hepatectomy | Omegaven | 6 | — | Medium and Long Chain Fat Emulsion Injection | 3 | Age, sex, Child-Pugh Score |
| Tao, 2011 [50] | China | RCT | 18/18 | 51.52/48.62 | Liver Transplantation | Omegaven | 6 | 100ml | ω-3/ω-6: 1/2 (I), 1/7 (C) | 2 | Age, sex, BMI, MELD, Child-pugh score, etiology, operative time, blood lose |
| Gong, 2016 [51] | China | RCT | 59/60 | 51.37/49.63 | Hepatectomy | Omegaven | 5 | 100ml | regular nutrition group (Kabiven) | 3 | Age, gender, BMI, Child-pugh score, ICG R15, pathology, resection range, blood loss, Pringle time or surgery time |
| Guo, 2018 [52] | China | RCT | 15/15 | — | Hepatectomy | Fresenius Kabi | 6 | — | Lipofundin (fat emulsion; Braun, Germany) | —— | Age, sex, number of T-cell sub-types, cellular inflammatory factors and immunoglobulin |
| Wu, 2012 [53] | China | RCT | 31/32 | 52.00/52.16 | Hepatectomy | Omegaven | 5 | 1.5 g/kg | without omega-3 fatty acid supplement | 6 | Age, sex, diagnosis, warm ischemia time, body mass index, liver function, blood loss and duration of surgery |
| Zhang, 2016 [54] | China | RCT | 157/155 | 47.6/49.6 | Hepatectomy | Omegaven | 5 | — | ω-3/ω-6: 1/2 (I), 1/7 (C) | 3 | Age, sex, weight, Child-Pugh Score, serum HBsAg and HBV-DNA status, FLR/SLV, serum biochemical parameters, Th/ Ts, NRI after PN and associated therapy after admission |
| Ibrahim，2016 [55] | Egypt | RCT | 20/20 | 30.20/31.00 | Liver Transplantation | Fresenius Kabi | 2 | 7 mL/kg | the same infusion rate of glucose 5% as placebo | 3 | Age, sex, BMI, graft (RT/LT lobe), fluid requirements, crystalloids, colloids, operative time |

Abbreviations: I the intervention group, C the control group, ω-3 ω-3 polyunsaturated fatty acid, ω-6 ω-6 polyunsaturated fatty acid, MCT/LCT medium and long-chain triglycerides