The Feasibility and Safety of Selected Live Liver Grafts Flushed with Cold Normal Saline and Comparison of Their Outcomes with Liver Grafts Flushed with Histidine-Tryptophan-Ketoglutarate (HTK) Solution

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ABSTRACT

To assess the feasibility and safety of selected liver grafts flushed with cold normal saline (NS) and compare their outcomes with Histidine-Tryptophan-Ketoglutarate (HTK) solution in living donor liver transplantation(LDLT).

Eighty right lobe liver grafts in LDLT flushed either with NS or preservative solution HTK, were studied and compared for various outcomes.

Demographics and clinical characteristics were comparable in the two groups. 5(12.5%) cases and 4(10%) controls developed EAD(p=0.72). Post-LT complications (biliary leak 2.5% in cases vs. 0 in control), strictures (15% in cases vs. 17.5% in controls), hepatic artery thrombosis (2.5% vs. 00%) and portal vein thrombosis (0 vs. 2.5%) were almost equally distributed. Mean hospital stay (10.80 + 2.36 and 11.78 + 2.91 days), 30-day mortality (2.5% vs 5%), and 1-year survival was comparable in both groups with a much cost effective approach.

In a selected cohort of right lobe LDLT recipients' preservation solutions can be avoided safely with comparable outcomes. In high-volume LDLT centers, avoiding preservation use can also result in saving costs without impacting outcomes.

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INTRODUCTION

Organ preservation solutions have a vital role in solid organ transplantation[1] and data on the type of solution and its role in live donor liver transplantation (LDLT) is not well characterized by standardized guidelines[2,3].

LDLT is the preferred option for LT in Asian countries with its specific advantages including shorter cold ischemia (CIT). This shorter CIT brings into question the use of preservation solutions in living donor grafts.

To assess the feasibility and safety of selected liver grafts flushed with cold normal saline (NS) and compare their outcomes with Histidine-Tryptophan-Ketoglutarate (HTK) solution in living donor liver transplantation(LDLT).

METHODS AND MATERIALS

Eighty right lobe liver grafts in LDLT flushed either with NS or HTK solution, were studied and compared for various outcomes, including early graft dysfunction, postoperative complications (biliary & vascular), hospital stay, and one-year survival.

These recipients were randomly assigned to receive "no preservation solution" (cases/non-HTK group; n=40) or "HTK group" (controls; n=40) (figure 01).

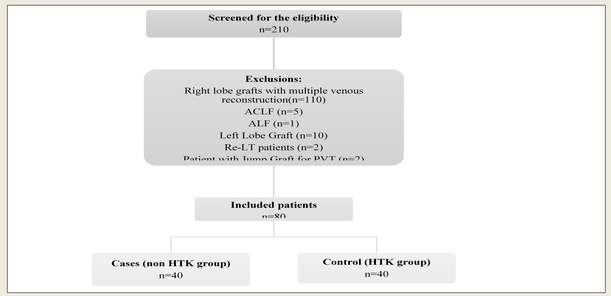

Figure 01. Showing study flow-diagram

RESULTS

Demographics and clinical characteristics (LAI, GRWR, CIT & WIT) were comparable in the two groups (p>0.05).

Comparing cases vs. controls mean bilirubin, ALT, AST, and INR on the 7th postoperative day were similar in the two groups. The cost of using a non-HTK-based approach was much lesser than the HTK solution ($1 vs $2000).

Table 01. Comparison of various outcomes in non-HTK and HTK groups

Complication	Non-HTK group (n= 40)	HTK group (n= 40)	p-value
EAD	5 (12.5%)	4 (10%)	0.72
PNF	00 (00%)	1 (2.5%)	0.31
ACR	3 (7.5%)	4 (10%)	0.69
HAT	1 (2.5%)	0 (00%)	0.31
Sepsis	4 (10%)	5 (12.5%)	0.72
PVT	00	1 (2.5%)	0.31
Biliary complications			
Stricture	6 (15%)	7 (17.5%)	0.76
Leak	1 (2.5%)	00(00%)	0.31
Clavin-dindo Grade≥III	12(30%)	13 (32.5%)	0.80
30-day Mortality	1 (2.5%)	2 (5%)	0.72
1-year mortality (excluding 1st month)	02 (5%)	2(5%)	1.0

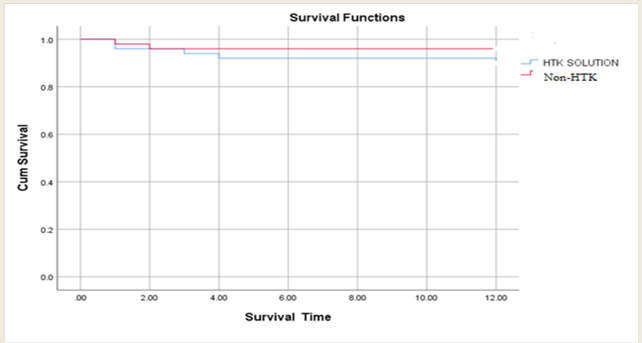

Figure 02. Kaplan-Meier showing comparable survival rate in non-HTK and HTK groups at 1-year post-liver transplantation (92% vs 90%) with post-log rank p=0.71

DISCUSSION

Preservative solutions used in LT are developed to maintain longer graft viability and to extend cold ischemia time, making these solutions an inevitable component of the transplant procedure.[4]

We are the first live donor liver transplant center to report that in selected recipients, where back table reconstruction is not needed and CIT is reduced, the non-HTK or cold NS preservation approach is comparable to the HTK preservation solution.

Avoiding commercial preservation solutions is safe and cost-effective with equivalent early graft dysfunction, post-operative complications, and graft & patient survival.

CONCLUSIONS

In a selected cohort of right lobe LDLT recipients' preservation solutions can be avoided safely with comparable outcomes. In high-volume LDLT centers, avoiding preservation use can also result in saving costs without impacting outcomes.

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