Living donor liver transplantation versus deceased donor liver transplantation for hepatocellular carcinoma: a meta-analysis

CRD summary
The review concluded that for patients with liver cancer (particularly those with hepatocellular carcinoma within the Milan criteria), living-donor liver transplantation represented an acceptable option that did not compromise patient survival or increase liver cancer recurrence compared with deceased-donor liver transplantation. The authors’ conclusions reflected the evidence presented, but paucity of evidence means their conclusions should be viewed as tentative.

Authors’ objectives
To compare the survival outcomes and recurrence rates for patients with hepatocellular carcinoma of living donor liver transplantation with deceased donor liver transplantation.

Searching
PubMed, EMBASE and The Cochrane Library were searched with no language or date restrictions. Limited search terms were reported. Google Scholar was also searched.

Study selection
Comparative studies of living donor liver transplantation and deceased donor liver transplantation for patients with hepatocellular carcinoma were eligible for inclusion. Studies had to be either randomised controlled trials (RCTs), prospective or retrospective controlled cohort studies. Sufficient data on patient survival, recurrence-free survival or recurrence rates had to be reported, as did sufficient description of methods and baseline characteristics.

Most included studies reported patients with hepatocellular carcinoma within the Milan criteria. Most studies were single centre. Tumour-related baseline variables were comparable between live and deceased donor recipients in each study, apart from shorter waiting periods and cold ischaemia time in the live donor recipient groups. Most of the participants were male. Studies were published from 2005 to 2012.

The authors did not state how many reviewers selected studies for inclusion in the review.

Assessment of study quality
Study quality was assessed using a modified Newcastle-Ottawa scale for cohort studies, which covered representativeness of exposed cohort and selection of unexposed cohort, ascertainment of exposure, incident disease, comparability, assessment of outcomes, length and adequacy of follow-up.

It was unclear how many reviewers assessed quality.

Data extraction
Data on patient survival, disease-free survival, recurrence-free survival and hepatocellular carcinoma recurrence rates in both groups were extracted to calculate odds ratios and 95% confidence intervals.

Two reviewers independently extracted data.

Methods of synthesis
Pooled odds ratios and 95% confidence intervals were calculated using a random-effects model. Statistical heterogeneity was assessed using $I^2$. $I^2$ of below 25% was regarded as low heterogeneity.

Subgroup analyses were conducted where patients met or exceeded the Milan criteria. Sensitivity analyses were also reported.

Publication bias was assessed using the Begg-Mazumdar and Egger tests.
Results of the review

Seven studies (1,310 participants) were included in the review, comprising six retrospective cohort studies and one prospective study. Most of the studies demonstrated sufficient quality with reasonable selection criteria, comparable patient characteristics, and adequate follow-up.

There were no significant differences between living-donor and deceased-donor liver transplantation recipients for survival rates at one year (OR 1.03, 95% CI 0.62 to 1.73; five studies; I²=0%), three years (OR 1.07, 95% CI 0.77 to 1.48; seven studies; I²=10%) and five years (OR 0.64, 95% CI 0.33 to 1.24; four studies; I²=47%). There were no significant differences for recurrence-free survival at one year (OR 0.86, 95% CI 0.54 to 1.38; three studies; I²=0%), three years (OR 1.04, 95% CI 0.69 to 1.58; four studies; I²=0%) and five years (OR 1.11, 95% CI 0.70 to 1.77; three studies; I²=0%).

There were also no significant differences between living-donor and deceased-donor liver transplantation recipients for recurrence rates at one year (OR 1.55, 95% CI 0.36 to 6.58; four studies; I²=40%), three years (OR 2.57, 95% CI 0.53 to 12.41; four studies; I²=72%) and five years (OR 1.21, 95% CI 0.44 to 3.32; three studies; I²=44%).

Subgroup analyses revealed similar outcomes for patients with hepatocellular carcinoma meeting the Milan criteria. Subgroup analyses stratifying studies according to sample proportion and sensitivity analyses were also reported.

There was no evidence of publication bias.

Authors’ conclusions

The result suggested that for patients with hepatocellular carcinoma (particularly those within the Milan criteria), living-donor liver transplantation represented an acceptable option that did not compromise patient survival or increase hepatocellular carcinoma recurrence in comparison with deceased-donor liver transplantation.

CRD commentary

The review question was clear with defined inclusion criteria. Some relevant sources were searched with no language restriction. Although no end search date was reported, the included studies were published up to 2012. Formal assessment reported no evidence of publication bias, but this assessment was unreliable for fewer than 10 studies. Appropriate methods were reported to reduce reviewer error and bias during data extraction, but it was unclear whether similar methods were used for study selection or assessment of quality.

An appropriate quality assessment was conducted; the results for each included study were reported. The methods of synthesis appear appropriate. There appeared to be a discrepancy in reporting the model used in the forest plot for recurrence free survival. A small number of studies were included and only a few studies reported data for some outcomes. The authors acknowledged that only post-transplant outcomes were reported, as few studies reported an intention-to-treat analysis.

The authors’ conclusions reflected the evidence presented, but the small number of included studies and the considerable heterogeneity for some outcomes mean that their conclusions should be viewed as tentative.

Implications of the review for practice and research

Practice: The authors stated that clinicians should carefully consider the use of live-donor liver transplant for patients with hepatocellular carcinoma within the Milan criteria when the availability of deceased-donors liver transplant was limited.

Research: The authors stated the need for further prospective studies, including intention-to-treat analyses, to assess the efficacy of live-donor liver transplantation in patients with hepatocellular carcinoma. Future studies should also report any adverse events that occur.

Funding

Key Clinical Project of the Chinese Ministry of Health; National High Technology Research and Development Program of China; National Natural Science Foundation of China; Special Fund for Science Research of the Chinese Ministry of Health.
Bibliographic details

PubMedID
22685095

DOI
10.1002/lt.23490

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Carcinoma, Hepatocellular /epidemiology /mortality /surgery; Female; Humans; Liver Neoplasms /epidemiology /mortality /surgery; Liver Transplantation /methods; Living Donors; Male; Neoplasm Recurrence, Local /epidemiology /mortality; Prevalence; Survival Rate; Time Factors; Tissue Donors; Treatment Outcome

AccessionNumber
12012050855

Date bibliographic record published
02/01/2013

Date abstract record published
26/03/2013

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.