

ARTICLE OF THE MONTH

Rodriguez RP, Perez BS, Daga JAP, et al. **Outcome of Liver Transplants Using Donors After Cardiac Death with Normothermic Regional Perfusion.** Transplantation proceedings 2022;54(1):37-40.

Abstract:

Background and aims: The incorporation of normothermic regional perfusion (NRP) to donors after cardiac death (DCD) allows the recovery of liver grafts without the deleterious effects on graft survival the super-rapid technique may cause. The aim of the present report is to determine if the use of NRP in Maastricht type III DCD donors achieves short- and medium-term results comparable to donors after brain death (DBD).

Patients and methods: This is an observational cohort study including 117 liver transplants executed between November 2016 and April 2021, divided into NRP (n = 39) and DBD (n = 78).

Results: Donors were younger in the NRP group (NRP 52 vs DBD 59.4 years; $P < .005$). Liver recipients in each study group were of similar age and severity of liver disease, although the predominant transplant indication in the NRP group was hepatocellular carcinoma. No differences in ischemia times were found. The incidence of early allograft dysfunction and primary nonfunction was balanced between NRP and DBD. Eight patients required retransplant, all of them in the DBD group. No differences were found in biliary complications (NRP 12% vs DBD 5%; $P = .104$). Ischemic cholangiopathy affected a single DBD patient. Graft survival's Kaplan Meier curve shows a better outcome in the NRP group, although the difference did not reach significance ($P = .075$).

Conclusions: The incorporation of perfusion machines, and specifically the NPR in situ, converts suboptimal liver grafts such as DCD into organs comparable to DBDs.

Summary:

In this observational cohort study¹ the authors compared the use of normothermic regional perfusion (NRP) in donation after cardiac death (DCD) donors to donation after brain death donors (DBD). A total of 117 liver transplants were included, 39 in the NRP group and 78 in the DBD group.

Donors for the two groups were largely similar with a few exceptions. Donor age was lower in the NRP group (52 vs. 59.4; $p = 0.005$). While the number of days in the ICU was higher in the NRP group (7.21 vs. 2.62; $p = 0.000$), the use of vasopressor support was higher in the DBD group (86.4% compared to 35.1%).

Recipient differences were similar for MELD scores for the NRP and DBD groups. (14.48 vs. 16.14; $p = 0.392$). The authors noted differences in indication for transplant between the two groups. For DBD, alcoholic cirrhosis was the most common indication followed by hepatocellular carcinoma. In the NRP group, hepatocellular carcinoma was the most common indication.

No primary endpoint was noted but overall survival was similar between the two groups. One year survival for the NRP group was 94% compared to 84% in the DBD group and at three years, survival was 71% for the NRP group and 75% for the DBD group. While the Kaplan-Meier curve showed better survival with the NRP group, this did not reach statistical significance ($p = 0.075$). Biliary complications were not statistically different between the two groups (NRP at 12%, DBD at 5%). Early allograft dysfunction, primary non-function, and acute kidney injury were similar between the two groups.

With constant need for donor organs, new ways to procure organs for transplant warrant consideration. Early evidence raised concerns on the rate of biliary complications with DCD donors that may limit their usefulness. However, NRP or machine perfusion appears to offer promise for DCD organ use while also minimizing biliary issues post-operatively. This small study adds to the body of evidence supporting the use of NRP for DCD organs.

References:

¹ Rodriguez RP, Perez BS, Daga JAP, et al. **Outcome of Liver Transplants Using Donors After Cardiac Death With Normothermic Regional Perfusion.** Transplantation proceedings 2022;54(1):37-40.