

Effects of Intravenous L-carnitine on Myocardial Fatty Acid Imaging in Hemodialysis Patients: Responders or Non-responders to L-carnitine

Masato Nishimura, MD, PhD¹, Toshiko Tokoro, MD, PhD², Toru Takatani, MD², Nodoka Sato MD, PhD³, Masaya Nishida, MD³, Tetsuya Hashimoto, MD³, Satoru Yamazaki, MD⁴, Hiroyuki Kobayashi, MD³, and Toshihiko Ono, MD³

¹Cardiovascular Division, ²Department of Nephrology, ³Department of Urology, Toujinkai Hospital, Kyoto, Japan. ⁴Department of Urology, Toujinkai Clinic, Kyoto, Japan

Objectives:

We investigated whether chronic intravenous administration of L-carnitine could improve myocardial fatty acid imaging in patients on maintenance hemodialysis.

Methods:

We enrolled 72 hemodialysis patients who had impaired myocardial fatty acid imaging and left ventricular dysfunction not based on coronary lesion. L-carnitine (1000 mg) was intravenously administered after dialysis for one year to 36 participants (Carnitine group), while not in the other 36 participants (Control group). Single-photon emission computed tomography (SPECT) using an iodinated fatty acid analogue, BMIPP, was performed. Uptake on SPECT images was graded in 17 segments on a five-point scale (0, normal; 4, absent) and assessed as BMIPP summed scores.

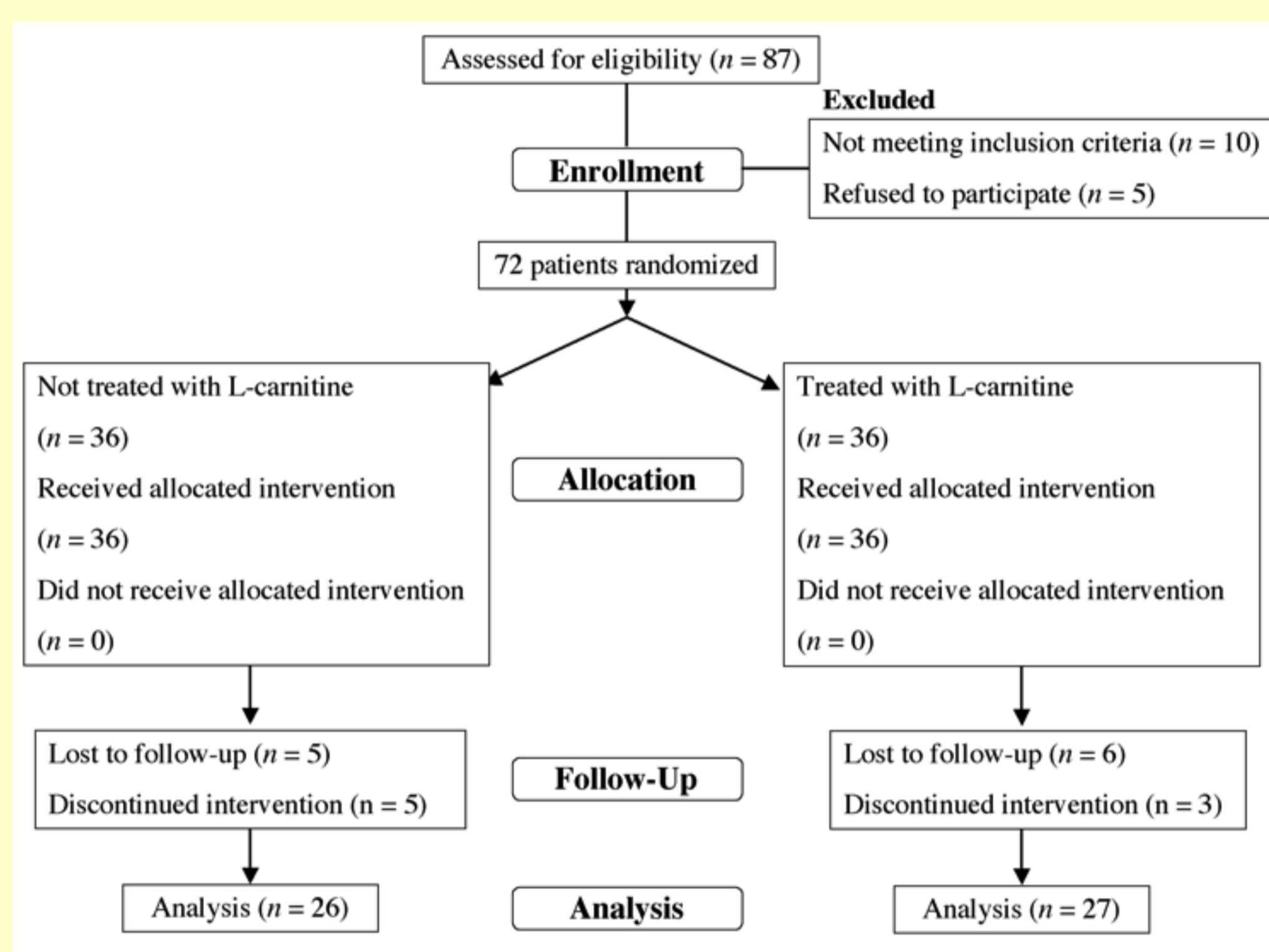


Figure 1. Participant flow chart.

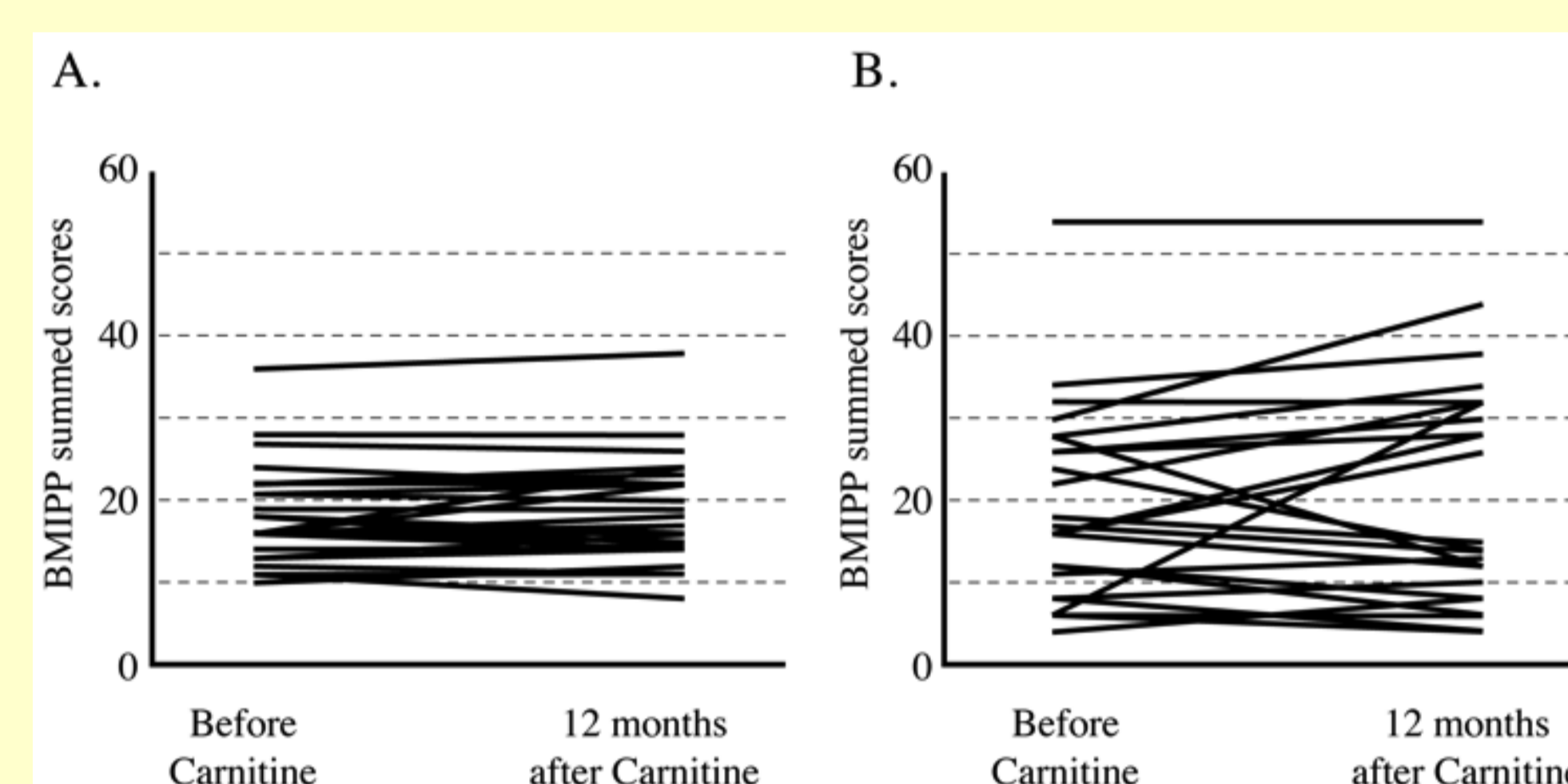


Figure 2. Changes in BMIPP summed scores before and 12 months after carnitine administration. A. Control group, $n = 26$. B. Carnitine group, $n = 27$.

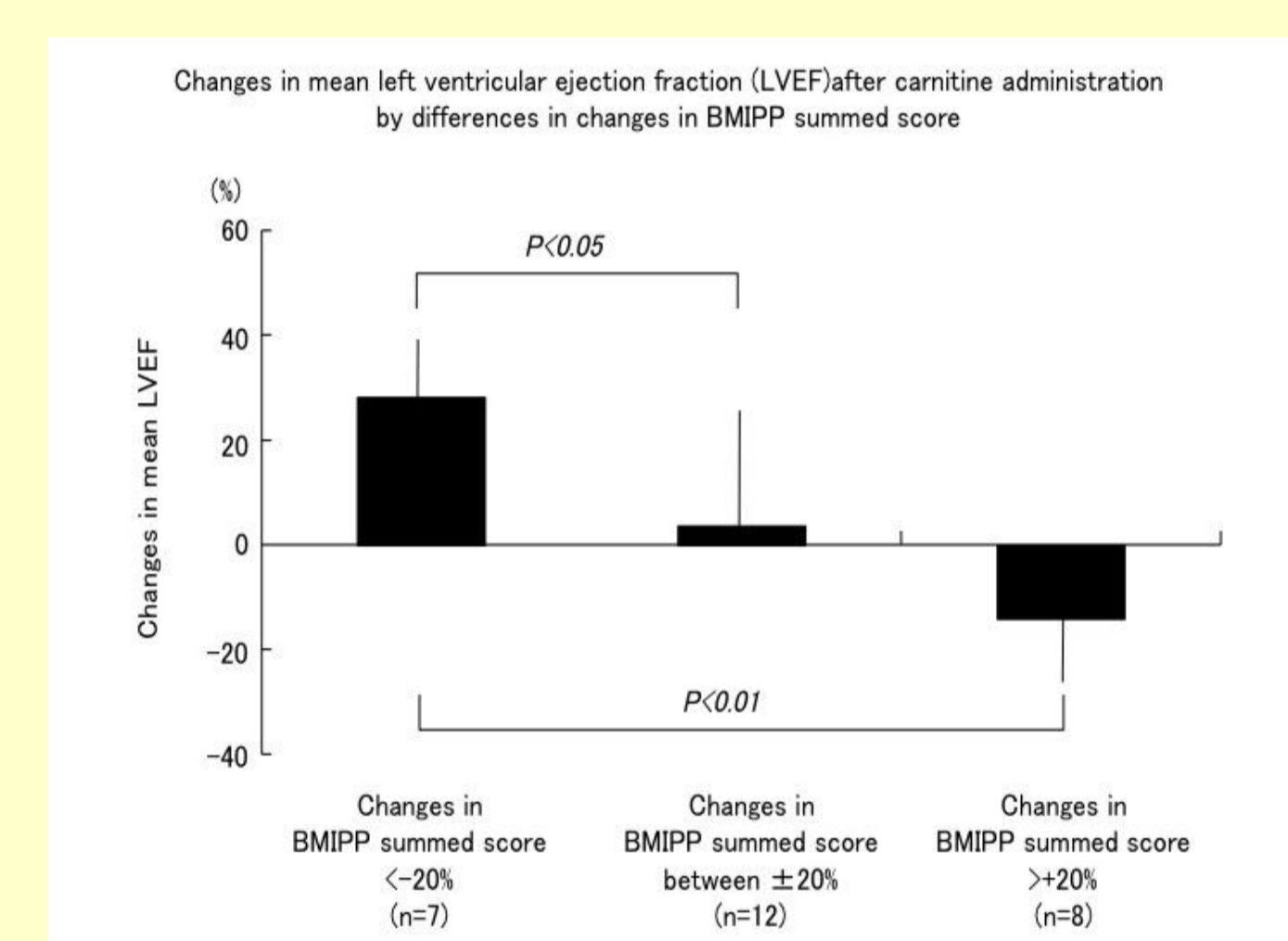


Figure 3. Differences in percent changes in mean left ventricular ejection fraction (LVEF) among subgroups divided by changes in BMIPP summed scores (SS) after intravenous administration of L-carnitine for one year.

Results:

During follow-up, 19 participants were discontinued from the study, and 53 participants (65 ± 12 years: 27 carnitine, 26 control) were analyzed (Fig.1). The mean BMIPP summed scores one year after carnitine administration did not differ from that before in the carnitine group, nor from that in the control group (Fig.2). However, improved SPECT (Changes in BMIPP summed scores $<-20\%$) was found in 7 (25.9%) participants in the carnitine, whereas in 2 (7.7%) in the control group (Fig.3). Multivariate logistic analysis showed the improved SPECT was inversely associated with baseline serum albumin levels (1 g/L: odds ratio, 0.669); the cut-off was 35 g/L.

Conclusions:

Chronic intravenous L-carnitine might improve myocardial fatty acid imaging in a selected group of hemodialysis patients with hypoalbuminemia.

