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Clinical Application of Bone Marrow Implantation in Patients With Arteriosclerosis Obliterans, and the Association Between Efficacy and the Number of Implanted Bone Marrow Cells

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Background There have been a number of recent reports on the use of autologous bone marrow implantation (BMI) in the treatment of peripheral arterial disease, with a clinical response rate of approximately 70%. However, the factors that influence efficacy have not yet been clarified. We have analyzed the relationship between the number of implanted bone marrow cells and the clinical efficacy of BMI.

Methods and Results Eight patients with arteriosclerosis obliterans were treated with BMI. Bone marrow was aspirated from the ilium (500–1,000 ml), the mononuclear cells were separated and then were implanted. The clinical effectiveness of BMI was evaluated by assessing changes in the ankle-brachial pressure index (ABI) and the transcutaneous oxygen pressure (TcO_2) between the pre-treatment baseline, with follow-up testing at 4 weeks. These changes were defined as ΔABI and ΔTcO_2. The mean number of CD34-positive cells was $1.04 \pm 0.60 \times 10^6$/kg body weight. There was a strong correlation between the number of CD34-positive cells and ΔABI ($r=0.754$, $p=0.028$).

Conclusions It is likely that the number of implanted CD34-positive cells is one of the primary factors that influence the clinical efficacy of BMI. (*Circ J* 2004; **68:** 1189–1193)

Key Words: Angiogenesis; Arteriosclerosis obliterans; Bone marrow implantation; CD34-positive cells; Mononuclear cells