

## **Arterial Stiffness Improvement and Plasma NOx Level Following Intake of Chlorella-Derived General Nutritional Supplements**

Presented at the 13<sup>th</sup> Meeting of the Clinical Blood Pressure and Pulse Wave Study Group (2013)

### **[Objectives]**

The aging-related increase of arterial stiffness (vascular hardness) serves as an independent risk factor for cardiovascular disease. We previously reported improvement in arterial stiffness of young people following intake of Chlorella (the 10<sup>th</sup> Scientific Meeting of the Japanese Society of Anti-Aging Medicine, 2010). However, the mechanism for such activity and the efficacy in middle-aged or elderly people remain to be clarified. The present clinical study was conducted to verify it.

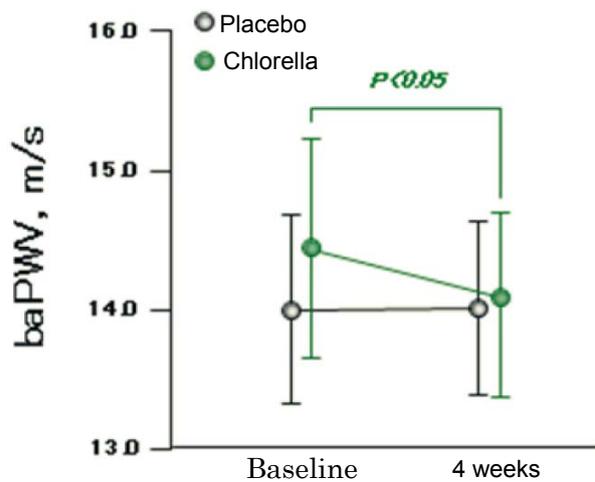
### **[Methods]**

The study was designed as a double-blind study comparing the Chlorella intake group with the placebo group, involving 33 healthy volunteers of both sexes aged 45-75 (mean: 62.2). Each subject ingested Chlorella tablets [1.5g] tablets twice daily (15 tablets/dose) for 4 weeks. Before and after the intake period, the volume pulse wave was measured at the brachium and the ankle to determine the brachial angle pulse wave velocity (baPWV). In addition, venous blood collected after a fast was measured as to plasma NOx level by the Griess method.

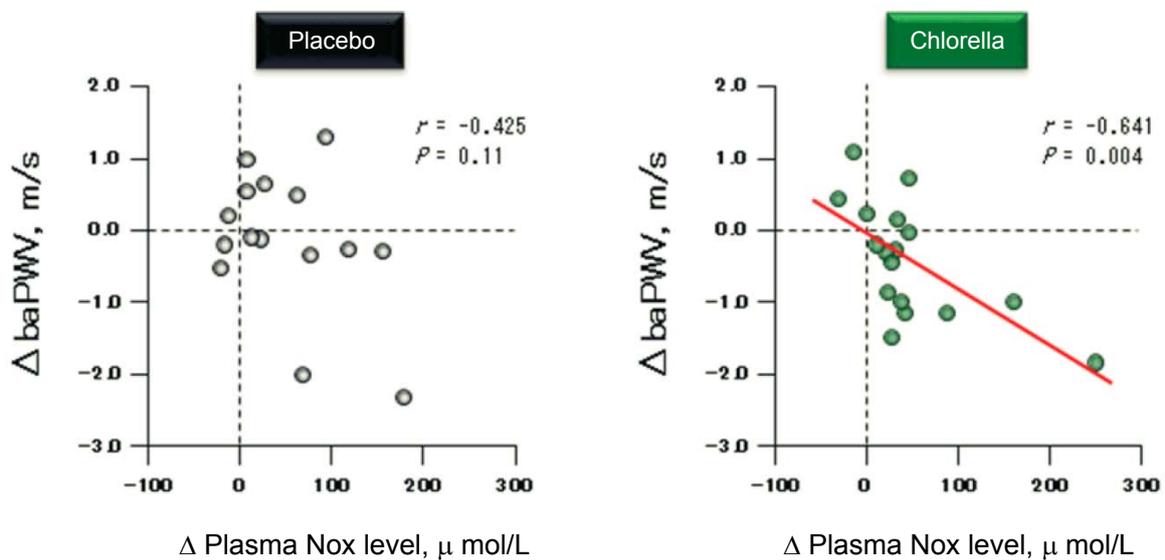
### **[Results]**

The tablet intake rate did not differ significantly between the two groups. In the placebo group, bPWV showed no significant change after intake as compared to the pre-intake level. In the Chlorella group, however, this parameter decreased significantly after intake ( $P=0.04$ , Fig. 1). Furthermore, the Chlorella group showed a significant correlation of the magnitude of change in baPWV following intake to the magnitude of change in plasma NOx level following intake ( $P=0.004$ , Fig. 2).

These results suggest that arterial stiffness can be improved by 4-week Chlorella intake also in middle-aged and elderly people and that an increase in the production of nitrogen monoxide by vascular endothelial cells is probably involved in improvement of arterial stiffness.



**Fig. 1. Changes in arterial stiffness**



**Fig. 2. Changes in NO secretion and arterial stiffness**

**<<Details>>**

Professional society meeting	: 13 <sup>th</sup> Meeting of the Clinical Blood Pressure and Pulse Wave Study Group (2013)
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