Arterial Blood Pressure Analysis on Viscera-state Following Acute Bleeding in Conscious Rat

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Acute bleeding in emergency medicine is not unusual. It could result in many compensatory responses, including the activation of sympathetic system, the inhibition of parasympathetic system, and the activation of hormone system. Traditional Chinese medicine theory indicates that Viscera-state controls the utility and redistribution of energy and material. When the blood in the vessel is lost, the route of Qi and blood and the principle of undulation should be shifted consequently. But the consequence of the activation of Viscera-state has not clearly been described in the past study. The purpose of this study is to investigate the response of the Viscera-state to the loss of blood by the analysis of arterial blood pressure.

Left femoral arterial blood pressure was measured using the blood pressure transducer, and right carotid artery pressure was recorded in term of the following parameters: systolic pressure, diastolic pressure, mean arterial pressure, and the pulse pressure. The arterial blood pressure was analyzed with Fast Fourier transformation and different stages of blood pressure were compared. The results were analyzed with ANOVA and t-test.

If the rats survived for 21 minutes after secondary bleeding, they were defined group 1. If they did not survived, they were defined group 2. The results demonstrate that the heart Qi value $C1$ of group 1 was significantly increased in 9-10 minutes after first bleeding. It may be induced by the significant increase of the liver Qi value $C0$ in 0-1 minutes after first bleeding. The liver Qi of group 2 was also induced at 5-6 minutes after bleeding. The kidney Qi $C2$ of group 2 was also induced, but is faster. These are consistent with the stress response in Chinese medicine theory is relative with the activation of liver and kidney Qi.

Key words　Acute bleeding, Viscera-state, Fast Fourier transformation