

Non-invasive blood glucose measurement Measurement of bioelectrical signal

Abstract

Impedance of blood relatively affected by blood glucose concentration. Blood electrical impedance value is varied with the content of blood glucose in a human body. This characteristic between glucose and electrical impedance has been proven by using four electrode method's measurement. The bioelectrical voltage output shows a difference between fasting and non-fasting blood glucose measured by using designed four tin lead alloy electrodes. 10 test subjects ages between 20-25 years old are UniMAP student has been participated in this experiment and measurement of blood glucose using current clinical measurement and designed device is obtained. Preliminary study using the developed device, has shown that glucose value in the range of 4-5mol/Liter having the range of 0.500V to -1.800V during fasting, and 0.100V or less during normal glucose condition, 5 to 11 mol/liter. On the other hand, It also shows that prediction of blood glucose using this design device could achieve relevant for measurement accuracy compared to gold standard measurement, the hand prick invasive measurement. This early result has support that there is an ample scope in blood electrical study for the non-invasive blood glucose measurement.

Keywords — Blood Impedance, blood glucose, bioelectrical, four electrodes measurement method