A simple photometer as a helping device in measuring blood glucose

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Abstrak

Fotometer Sederhana sebagai Alat Bantu Pengukuran Glukosa Darah. Pengukuran glukosa darah secara non- invasif merupakan salah satu cara untuk meningkatkan frekuensi pemantauan glukosa darah mandiri (PGDM). Untuk yang berbasis spektoskopi reflektansi NIR, penerapannya secara non-invasif terkendala nilai standar error of prediction yang tinggi. Namun demikian metode ini secara teori masih dapat dipakai untuk memprediksi kadar glukosa darah pada kondisi tertentu seperti keadaan hipoglikemia (<55 mg/dL), gula darah puasa (GDP) terkendali (70-115 mg/dL), dan hiperglikemia (>225 mg/dL). membantu pemantauan glukosa darah (PGDM pada kondisi GDP terkendali dan hiperglikemia). Hal ini dapat dilihat dari rata-rata persentase jumlah hari dengan kondisi GDP harian terkendali yang lebih besar pada PGDM yang dibantu dengan fotometer dibandingkan PDGM yang dilakukan hanya satu kali sehari (28% berbanding 18%, p = 0,344).

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Measurement of non-invasive blood glucose is one way to increase the frequency of self-monitoring of blood glucose (SMBG). For NIR reflectance spectroscopy, its application in non-invasive constrained by high value of standard error of prediction. The mean standard error of prediction was 25 mg/dL. Theoretically, NIR reflectance spectroscopy still can be used to predict blood glucose levels in certain conditions such as hypoglycemia (<55 mg/dL), controlled fasting blood glucose (FBG) (70-115 mg/dL), and hyperglycemia (>225 mg/dL), which the difference between the three conditions is more than 25 mg/dL. The results showed that there were significant differences in standards values of photometer measurement between controlled FBG and hyperglycemic conditions (p = 0.002). The results also showed that the photometer can be used to assist the monitoring of blood glucose in FBG under control and hyperglycemic conditions. It can be seen from the average percentage of the daily controlled FBG conditionsin patients conducting SMBG in photometer-assisted compared to in patientsonly use SMBG once a day (28% versus 18%, p = 0.344).