Development of highly sensitive analysis of glycated protein in human hair by luminol chemiluminescence

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Glycated protein and glucose as indicators of glycemic control are accepted by using of blood sample in the medical field. Hair as clinical specimen might be useful for diagnosis with non-invasively sampling and stored for long time. In the present study, a highly sensitive, easy and simple method was developed for diabetes screening in hair by luminol chemiluminescence using microtiterplate. It has been reported that HPLC method by measurement of furosine in hair was developed and required a large amount of hair (10-50 mg). In the present study, we investigated the chemiluminescence method for measurement of glycated protein by small amount (1 cm) of hair. In order to analysis precisely the glycated protein, a new glycation index which is based on the ratio of glycated protein and arginine in hair protein was studied. This index of diabetes patients gave significantly higher values than those of healthy subjects (p < 0.003). These indices remarkably correlated with the levels of glycohemoglobin(HbA1C) in diabetes patients and healthy subjects(r = 0.98). The analysis of glycated protein in hair makes possible to evaluate past advanced stage of diabetes mellitus. Based on our present study, the proposed method could be useful in monitoring of diagnosis of diabetes mellitus.

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