

Continuous glucose monitoring in young and older healthy adults:
Investigation of glycemic variability and glycemic control, association with
sleep-related characteristics and relationship with cortisol,
vitamin D and chrononutrition

Dissertation

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The ageing process is characterised by changes in glucose metabolism, sleep, cortisol, vitamin D and chrononutritional aspects (e.g. meal frequency and timing). Continuous glucose monitoring (CGM) can be used to provide information on glycemic variability and glycemic control.

34 young (20-35 y.) and 27 older (60-75 y.) healthy adults were investigated to determine whether there are differences (1) in CGM parameters between young and older adults and whether there are differences between day and night, (2) in the relationship between CGM parameters and sleep quality and distribution of sleep stages between young and older adults, (3) in the relationship between CGM parameters and cortisol between young and older adults, (4) in the relationship between CGM parameters and vitamin D between young and older adults, (5) in chrononutritional parameters between young and older adults and whether there is a relationship with CGM parameters considering morningness-eveningness preference.

(1) The older age group had higher glucose concentrations and a higher risk of hyperglycemia. Healthy ageing appears to have only minor influence on glycemic variability. (2) In older adults, sleep period time was associated with a higher glucose concentration and a higher risk of hyperglycemia. In young adults, a higher proportion of slow wave sleep was correlated with a lower glucose concentration and a higher risk of hypoglycemia. (3) A lower cortisol concentration after awakening was associated with a higher glucose concentration and a lower risk of hypoglycemia in young adults. (4) There was no association between vitamin D and CGM parameters in any age group. (5) In young adults, there were correlations between increased meal frequency, an earlier first meal and a longer eating window and lower glucose concentrations and an increased risk of hypoglycemia. These associations were weaker or no longer significant controlling for morningness-eveningness preference.