Abdominal bioimpedance device is a useful to detect fasting blood glucose impairment in middle-aged men

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Introduction: Visceral abdominal adipose tissue (VAT) has been strongly associated with metabolic syndrome (MS) markers as fasting glycaemia. VAT measurement is a time-consuming and expensive and as consequence impractical for clinical and field settings. Recently, a new portable bioelectrical impedance device for abdominal region (Viscan™) has been developed, which estimates total abdominal fat (TAF) and VAT. However, there is a lack of cut-off values, which allow us to use Viscan™ results as diagnostic tool. It was our aim to find cut-off values from Viscan™ results for glycaemia impairment diagnostic.

Methods: 77 Caucasian males were enrolled [age: 37.0 ± 9.7 years; weight: 84.8 ± 13.2 kg; 174.4 ± 7.5 cm; 27.8 ± 3.98 kg/m²]. Fasting plasma blood glucose (FBG) was measured using glucose hexokinase methodology. VAT and TAF were measured with Bla (Viscan™). Two groups were created, subjects with glucose impairment (fasting glucose >110 mg/dl) and without. ROC analyses were performed to determine cut-off points to have glucose impairment.

Results: Areas under curves of VAT and TAF were 0.72 ± 0.10 (95% CI: 0.612 to 0.824) and 0.79 ± 0.11 (95% CI: 0.685 to 0.879) respectively. ROC analysis showed cut-off points of 12 and 37.2% for VAT and TAF.

Conclusion: The main finding of this analysis was VAT and FAT showed good sensitivity and specificity to diagnose impairment on FBG in Caucasian middle-aged men, hence it suggests Viscan™ as a useful tool to perform MS screening. Nevertheless, the cut-offs values obtained must be confirmed on larger samples.

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Objective measurement of life-style behaviours in free-living conditions: Development and validation of a posture-recognition algorithm from triaxial accelerometer data

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Introduction: Developing methods to monitor physical activity (PA) in free-living conditions is essential to study the relationships between PA -or the lack of PA- and health. Accelerometers enable continuous measurements of PA levels over extended periods of time. However, they often underestimate PA levels associated to cycling and fail to capture low-intensity activities, two of the main targets of interventions aimed to preventing or treating obesity. In order to overcome these limitations we developed a classification algorithm capable of identifying 8 types of PA from triaxial accelerometer data.

Methods: Data from 63 subjects (n=29 with BMI<25, n=17 with 25-BMI<30, n=17 BMI>30) wearing a triaxial accelerometer (MotionPOD™, Movea) while performing standardized activities in the laboratory, were used to calibrate the algorithm. First, advanced signal processing was used to determine the sensor orientation. Then, a machine learning approach based on hidden Markov models was applied to identify 8 types of PA (lying down, slumped, sitting, standing, pacing, running, jumping, climbing).