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Correlative Ultrasound Evaluation of Anterior Abdominal Wall Subcutaneous Tissue Thickness in Type 2 Diabetic and Non-Diabetic Adults

Évaluation Échographique Corrélatrice de l'Épaisseur du Tissu Sous-Cutané de la Paroi Abdominale Antérieure chez les Adultes Diabétiques et Non Diabétiques de Type 2

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ABSTRACT

BACKGROUND: Subcutaneous fat accumulation complicating diabetes mellitus (DM) has long been recognised, even as its clinical significance remains controversial. Ultrasound is safe and accurate in assessing soft tissue dimensions. Reports on ultrasound evaluation of anterior abdominal wall subcutaneous fat in diabetic and apparently healthy normoglycaemic subjects are scanty in the Nigerian environment

AIMS AND OBJECTIVES: To sonographically assess and compare the mean anterior abdominal wall subcutaneous tissue thickness (AAST) in adult diabetic subjects and apparently healthy, normoglycaemic subjects and correlate the values with age, gender, body mass index (BMI), waist circumference (WC), waist to hip ratio (WHR) and glycated hemoglobin (Hb1c).

MATERIALS AND METHODS: The AAST in 150 adult diabetic subjects and equal numbers of age, and sex matched apparently healthy individuals was assessed with a SONOACE X4 ultrasound scanner. (Medison Inc, SOUTH KOREA), using a linear array transducer of frequency 7.5MHz-10MHz. Measurements were taken in the midline at two points; 2cm above and below the umbilicus. Anthropometric parameters such as BMI, WC, WHR, were recorded.

RESULTS: Adult diabetic subjects had significantly higher AAST values, compared to age and BMI matched male and female apparently healthy controls respectively. (2.7 ± 0.9 cm vs 2.2 ± 0.9 cm (below the umbilicus; $p=0.001$), and 2.1 ± 0.8 cm vs 1.6 ± 0.8 cm (above the umbilicus; $p=0.001$). Below the umbilicus, AAST correlated positively with WHR, BMI and disease duration among diabetic patients.

CONCLUSION: AAST is significantly increased in diabetic subjects compared to controls, and can be a useful guide in the management of obesity in these patients. There is correlation of AAST below the umbilicus with BMI and waist circumference. **WAJM 2022; 39(5): 465–470.**

Keywords: Anterior abdominal wall, diabetes, obesity, soft tissue, ultrasound.

RÉSUMÉ

CONTEXTE: Accumulation de graisse sous-cutanée compliquant le diabète sucré (DM) est reconnu depuis longtemps, même s'il est clinique l'importance est restée controversée. L'échographie est sûre et précise dans l'évaluation des dimensions des tissus mous. Rapports sur l'évaluation échographique de graisse sous-cutanée de la paroi abdominale antérieure chez le diabétique et apparemment les sujets normoglycémiques en bonne santé sont rares au Nigéria environnement.

BUTS ET OBJECTIFS: Évaluer et comparer par échographie l'épaisseur moyenne du tissu sous-cutané de la paroi abdominale antérieure (AAST) chez les sujets diabétiques adultes et apparemment en bonne santé, normoglycémique sujets et corréler les valeurs avec l'âge, le sexe, indice de masse corporelle (IMC), tour de taille (WC), taille à hanches rapport (WHR) et hémoglobine glyquée (Hb1c).

MATÉRIAUX ET MÉTHODES: L'AAST chez 150 diabétiques adultes sujets et nombre égal d'âge et de sexe apparié apparemment en bonne santé ont été évalués à l'aide d'un échographe SONOACE X4. (Medison Inc, CORÉE DU SUD), en utilisant un transducteur linéaire de fréquence 7,5 MHz-10 MHz. Des mesures ont été prises dans la ligne médiane en deux points; 2cm au-dessus et au-dessous de l'ombilic. Anthropométrie des paramètres tels que l'IMC, WC, WHR, ont été enregistrés.

RÉSULTATS: Les sujets diabétiques adultes avaient un AAST significativement plus élevée valeurs, par rapport à l'âge et à l'IMC appariés hommes et femmes apparemment contrôles sains respectivement. ($2,7 \pm 0,9$ cm vs $2,2 \pm 0,9$ cm (sous l'ombilic; $p=0,001$), et $2,1 \pm 0,8$ cm contre $1,6 \pm 0,8$ cm (au-dessus de l'ombilic; $p=0,001$). Sous l'ombilic, AAST corrélé positivement avec WHR, BMI et durée de la maladie chez les diabétiques patient.

CONCLUSION: AAST est significativement augmenté chez les sujets diabétiques par rapport aux contrôles, et peut être un guide utile dans la gestion d'obésité chez ces patients. Il y a une corrélation de l'AAST sous l'ombilic avec IMC et tour de taille. **WAJM 2022; 39(5): 465–470.**

Mots-clés: Paroi abdominale antérieure, diabète, obésité, tissus mous, ultrason.

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Abbreviations: AAST, Anterior Abdominal Wall Subcutaneous Tissue Thickness; **BMI**, Body Mass Index; **DM**, Diabetes Mellitus; **HbA_{1c}**, Glycated Haemoglobin; **HC**, Hip Circumference; **WC**, Waist Circumference; **WHR**, Waist to Hip Ratio; **WHtR**, Waist to Height Ratio.