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NEWS

The Echogenic Appearance of the Diabetic Deltoid Muscle on Shoulder Ultrasound: Is This Simply from Adipose Tissue Infiltration, Can This Appearance Predict Type 2 Diabetes and be Used to Detect Pre-Diabetes?

All Day | MK346-SD-SUA1-ALL | MK Community, Learning Center Station #1

PURPOSE

To evaluate the association of an echogenic deltoid muscle seen in type 2 diabetics during shoulder ultrasound versus the deltoid muscle appearance in non-diabetic obese patients and for any corresponding associations.

METHOD AND MATERIALS

The study Included 137 shoulder ultrasounds from type 2 diabetics, Including 13 pre-diabetics, confirmed by hemoglobin A 1 c levels and medications. It also included 49 ultrasounds from non-diabetic obese patients based on body mass index (BMI). Images of the deltoid muscle were blindly reviewed by 3 musculoskeletal radiologists as to whether the appearance was normal, suspected diabetic or definite diabetic. These results along with the patient's age, sex, race, hemoglobin A 1 c level, BMI, and the use of insulin were analyzed.

RESULTS

A consensus diagnosis of 'definite diabetic' by 3 musculoskeletal radiologists based on an echogenic appearing deltoid muscle on ultrasound was a powerful predictor of diabetic status. The positive predictive value for the accurate designation of 'definite diabetic' was 89% (70 of 79 diabetic patients). An echogenic deltoid muscle was also a powerful predictor of pre-diabetes. Of 13 pre-diabetic ultrasounds reviewed, 13 were assigned either 'suspected diabetic' (3 of 13, 23%) or 'definite diabetic' (10 of 13, 77%) (P"' 0.062). Obesity alone cannot solely explain the appearance of an echogenic deltoid muscle in diabetics. Nonobese diabetics were diagnosed 'definite diabetic' with 30% sensitivity (11 of 37 non-obese diabetics). Diabetic patients with a higher BMI, were more often diagnosed 'definite diabetic'. Of 137 diabetic ultrasounds reviewed, 31(22.6%) were designated 'normal' (BMI 30.9 ± 7.3), 36 (26.2%) designated 'suspected diabetic' (BMI 32.6 ± 6.9), and 70 (51.2%) designated 'definite diabetic' (BMI 37 .5 ± 8).

CONCLUSION

The ultrasound appearance of an echogenic deltoid muscle is a strong predictor of type 2 diabetes and seems to be due to more than just adipose Infiltration. It could be related to impaired lnsulin-stlmul11ted intramuscular glycogen synthesis or Issues with collagen synthesis. We also conclude that this appearance may be used to detect pre-diabetes.

CLINICAL RELEVANCE/APPLICATION

Ultrasound of the type 2 diabetic deltoid muscle demonstrates increased echogenicity which is likely secondary to insulin resistance and may be used as a noninvasive means to detect pre-diabetes.