COMPARISON OF BONE MINERAL DENSITY AND ULTRASOUND PARAMETERS IN PATIENTS WITH POLYCYSTIC OVARIAN SYNDROME AND TYPE 2 DIABETIC WOMEN

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BACKGROUND

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in women, affecting 6–10% of women of reproductive age. In addition to its classical characteristics (menstrual irregularity of the oligo/amenorrhea type, chronic anovulation, infertility, and clinical and/or laboratory hyperandrogenism), this syndrome is also associated with several features of metabolic syndrome, such as obesity, abdominal obesity and insulin resistance (IR).

In type 2 diabetes hyperinsulinemia, insulin resistance and increased body weight may result in an increase of bone mass; however, accumulation of advanced glycation end products within the bone collagen driven by glucotoxicity may increase the cortical porosity.

AIMS

Skeletal health in patients with patients with polycystic ovarian syndrome (PCOS) and type 2 diabetes mellitus (T2DM) is an area of interest and controversy.

The aim of the study was to compare the bone mineral density (BMD) measurements and quantitative ultrasound (QUS) parameters between the patients with polycystic ovarian syndrome and the body mass index (BMI) matched type 2 diabetic women.

PATIENTS AND METHODS

Ten women with PCOS were age- and weight-matched to 17 T2DM (*Table1*.).

Lumbar spine bone mineral density (BMD), femoral neck BMD were measured by DXA *(Prodigy, GE Lunar)*.

The QUS examination consisted of measuring the attenuation (BUA) and the speed of the ultrasound (SOS) transversing the calcanei (*Achilles InSight, GE Lunar*) .

Results were analysed with a biometric software (SPSS16.0), using a t-test following the calculation of averages and SE. Correlation analysis was also performed between QUS and BMD measurements in both groups. Statistical significance of the tests was set at $p<0.05$.

RESULTS

Patients with T2DM had higher BMD in the lumbar spine (L2-L4) than patients with PCOS, but we found no statistically significant differences in the femoral neck density (*Table 2.*). QUS measurements showed similar values in both groups (*Table 2.*).

There was a moderate and significant positive relationship between SOS and BMD measurements in both groups (*Table 3.*).

Table 1. **Anthropometric data**

mean +/- SE	**PCOS (n=10)**	**T2DM (n=17)**
Age (ys)	27.1±1.3	26.9±1.5
Weight (kg)	74.1±4.5	71.3±4.4
Height (cm)	168.2±3.5	167.5±4.2
BMI (kg/m²)	26.3±0.5	25.7±0.7

Table 2. **DXA and QUS parameters in PCOS and T2DM women**

	PCOS (n=10)	**T2DM (n=17)**	**p**
BMD(mean+/-SE)			
L_{1-4} (g/cm²)	1.09±0.03	0.992±0.02	0.004
Femoral neck (g/cm²)	0.984±0.02	0.945±0.02	NS
QUS (mean+/-SE)			
BUA (dB/Mhz)	70.3±7.7	68.7±11.2	NS
SOS (m/sec)	1531±25.2	1532±19.2	NS

Table 3. **Correlation analysis between QUS and BMD measurements in both groups**

*: p<0,05	**PCOS**		**T2DM**	
	LBMD	**FBMD**	**LBMD**	**FBMD**
Age	-0,375*	-0,334*	-0,363*	-0,354*
BMI	0,485*	0,451*	0,487*	0,431*
BUA	0,425*	0,537*	0,585*	0,541*
SOS	0,524*	0,486*	0,514*	0,526*

CONCLUSION

In conclusion, the present study compared differences in bone mass measurement using two different methods, namely DXA and QUS.

Differences in bone mass as measured by DXA and QUS in PCOS and T2DM women do not change in parallel.

Our results indicate that QUS can provide useful information in the skeletal assessment of patients with PCOS and T2DM, but QUS cannot replace DXA.