

REGIONAL DISTRIBUTION OF BODY FAT MASS AND FAT-BONE INTERACTIONS IN MEN WITH CHRONIC OBSTRUCTIVE PULMONARE DISEASE

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The aim was to evaluate the regional distribution of body fat mass (DBFM) in relation to COPD progression as well as the relationships between DBFM and tumor necrosis factor (TNF- α), free testosterone (FT) and markers of bone metabolism - ionized Ca^{+2} (IC), osteocalcin (OC), β -Cross-Labs (β CL). DBFM and bone mineral density (BMD) at femoral neck and in lumbar spine L₁-L₄ were measured by X-ray absorptiometry. 92 COPD pts (40-70 yrs old) and control group (15 healthy men matched according to age and body mass index - BMI) were examined. These pts were divided into 3 groups according to COPD severity: COPD₁ - 23 men (GOLD I stage; age - 55 yrs; FEV₁ - 80%; BMI - 27 kg/m²; smokers - 79%); COPD₂ - 47 pts (GOLD II; age - 57 yrs; FEV₁ - 55%; BMI - 29 kg/m²; smokers - 78%) and COPD₃ - 22 men (GOLD III; age - 60 yrs; FEV₁ - 33%; BMI - 25 kg/m²; smokers - 86%). We detected a significant increase of share fat mass (FM) in arms, legs, trunk as well as in android (A) and gynoid (G) regions in COPD_{1,2} vs. the control and their subsequent sharp decline in COPD₃ (to the control level and below). BMD in lumbar spine and at femoral neck was significantly decreased during COPD progression, particularly in COPD_{2,3} (by 12%; 21% and 8%; 21% respectively vs. the control). So, the prevalence of osteopenia and osteoporosis were detected in these groups in 47%, 4% and 55%, 27% of cases respectively. The TNF- α level was significantly increased with worsening of COPD (10,4; 13,1; 14,1 pg/ml respectively in COPD_{1,2,3} vs. the control 8,5 pg/ml). FT level was lower in all groups vs. control (7,4; 7,5; 5,6 and 10,5 pg/ml respectively; $p < 0,05$). The levels of IC and OC were significantly decreased during COPD progression (1,0; 0,93; 0,92 mmol/l in COPD_{1,2,3} vs. the control - 1,2 mmol/l and 17,0; 15,1; 15,0 ng/ml vs. the control 19,4 respectively). Vice versa, β CL level was increased in COPD_{2,3} (0,40 and 0,37 ng/ml vs. the control 0,28 ng/ml; $p < 0,05$). FM in A region was moderately correlated with TNF- α level in all groups. Markers of bone metabolism correlated with distribution of adipose tissue. Thus, we detected the moderate positive correlations between β CL and total FM, FM in A region in all groups. Loss of BMD was significantly correlated with loss of BMI, A/G ratio, FM in all body regions and IC. Although these pts had decreased BMD, but BMI was increased (29.4 kg/m² in pts with osteopenia and 24.7 kg/m² with osteoporosis, respectively). **Conclusions:** Severe COPD was associated with: decreasing in share of FM in arms, legs, trunk as well as in A and G regions against the background of low FT level and decreasing of BMD at lumbar spine and in femoral neck. Low BMI is not a determining factor in the reduction of BMD in these pts. The results of the correlation analysis showed the existence of agreed changes in DBFM and BMI.