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**Title:** Bone turnover markers and vitamin D status in patients with cystic fibrosis

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**Body:** Imbalance between bone formation and degradation in cystic fibrosis(CF)has become an important issue for developing osteopenia.The aim of our study was to assess bone formation and resorption process with bone markers in prepubertal,pubertal and young adult CF patients. Materials and methods: The study included 70 clinically stable CF patients who regularly attended the Cystic fibrosis center at the Pediatric Clinic in Skopje, R.Macedonia .Serum osteocalcin (OC),  $\beta$ cross laps, 25OHD and PTH were determine by ELISA assays in prepubertal CF group (mean age  $\pm$  SD  $8.5 \pm 2.4$  years), pubertal CF group (mean age  $\pm$ SD  $15 \pm 2.4$ years) and young adults (mean age $\pm$ SD  $25 \pm 2.7$  years) and in age-match controls. Results: 25OHD in prepubertal groups was( $25.56 \pm 12.1$  ng/ml versus  $27.75 \pm 2.1$ ,  $p=0.05$ ),osteocalcin( $81.06 \pm 21.1$  ng/ml v.  $96.57 \pm 11.2$ ,  $p=0.004$ ) $\beta$ crosslaps( $1.33 \pm 0.3$  ng/ml v.  $1.57 \pm 0.4$ ,  $p=0.03$ )and PTH ( $31.7 \pm 12.3$  pg/ml v. $21.07 \pm 11.6$ , $p=0.002$ ).In the pubertal groups laboratory parameters were (25OHD  $22.07 \pm 10$  v.  $29.4 \pm 8.3$ ,  $p=0.07$ ; OC  $77.035 \pm 11.2$  v. $101.4 \pm 10$ , $p=0.004$ ; $\beta$ crosslaps  $1.419 \pm 0.5$  v. $1.118 \pm 0.7$ , $p=0.1$ ;PTH  $40.6 \pm 11.3$  v. $35.5 \pm 10$ , $p=0.2$ ).In adult groups(25OHD was  $20.4 \pm 8.4$  v.  $22.78 \pm 7.84$ ,  $p=0.01$ ; OC  $27.66 \pm 12.1$  v.  $17.02 \pm 4.98$ ,  $p=0.05$ ; $\beta$ crosslaps  $0.58 \pm 0.3$  v.  $0.25 \pm 0.06$ ,  $p=0.3$ ; PTH  $65.93 \pm 9.6$  v.  $45 \pm 9.4$ , $p=0.2$ ). In prepubertal and adult CF patients bone markers were higher than normal values, but with no significance from the healthy controls.OC in pubertal CF patients correlates significantly with the control, indicate a decreased formation rate whereas resorption rate is normal. This may contribute to impaired bone turnover. Conclusion: Our results suggest that bone remodeling in CF patients can be impaired in puberty and lead to osteopenia.