# ASSOCIATION OF PERIPHERAL BONE FRACTURES AND SIGNS OF UNDIFFERENTIATED CONNECTIVE TISSUE DYSPLASIA

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# BACKGROUND

- Undifferentiated connective tissue dysplasia (UCTD) is a genetically determined condition characterized by connective tissue fibers and intercellular matrix defects

- UCTD is diagnosed in every 5th young adult (Nechaeva G. I.)

- Bone and joints conditions, such as hypermobility, joint pain and low traumatic fractures, are the most frequent UCTD manifestations

# THE AIM OF THE STUDY

- The aim of the study was to determine the UCTD signs number and low traumatic fractures not related to age, osteoporosis or medication intake.

# METHODS

- A cross-sectional study of 464 patients
- Inclusion criteria were: signed informed consent
- Exclusion criteria were:
  refusal to sign the informed consent form,
  acute or chronic conditions (including osteoporosis,
  Marfan syndrome, Ehlers-Danlos syndrome,
  osteogenesis imperfecta, etc.)
  likely to affect BMD or quality of bone tissue,
  use of glucocorticoids,
  use of immunosuppressive drugs.
- 6 persons met the exclusion criteria, 458 were
  included in the analysis.

# METHODS

- Physical examination included anthropometry and body mass index (BMI) calculation, measurement of arms span and its ratio to height, hands and legs length.

- A total of 48 external signs of UCTD were evaluated

- Detection of 6 or more UCTD signs cluster in a person were estimated as confirmed UCTD.

- Fractures history, quantity and localization were registered.

- Statistica 13.0. (License No. JPZ904I805602ARCN25ACD-6) software was used to process the data. Mann-Whitney, $\chi^2$ criteria, Spearman rank correlation coefficient were used. The differences were considered significant at $P<0.05$.

# RESULTS

- 458 persons aged from 18 to 65
- the median age was 22 (25%-75%: 20-23) years
- Main Group consisted of 290 patients (63.3%) who met the UCTD criteria,
- the Control Group included 168 persons who had no UCDT (36.7%).
- History of bone fractures was reported by 143 participants (31.2%): 74 persons had 1 fracture, 26 patients had 2 fractures, and 43 persons had a history of 3 to 23 fractures.
- All persons with multiple fractures (7 or more) belonged to the main group.

# RESULTS

- Weak positive correlations of the total number of fractures with the number of external signs of UCTD (r=0.16, t=3.63,p<0.0001)
-  with the total number of external and internal signs of CTD (r=0.22, t=4.88, p<0.0001)
-  with the Beighton score (r=0.19, t=4.16, p<0.0001)
- with height (r=0.11, t=2.32, p=0.02),
-  with  arm span (r=0.12, t=2.52, p=0.011),
- with SI (r=0.12, t=2.57, p=0.01) were revealed.

# Comparison of the study groups (Me, 25%,75%)

| Parameter | Main group (n=290) | Control group (n=168) | P |
|---|---|---|---|
| Age, years | 22 (20÷23) | 22 (20÷23) | 0,87 |
| Height (cm) | 173,5 (169÷180) | 173 (168÷178) | 0,16 |
| Bodymass (kg) | 68 (59÷77) | 70 (63÷77) | 0,065 |
| **BMI (kg/m$^2$)** | 22,2 (20,2÷24,3) | 23,5 (21,5÷25,2) | **<0.0001** |
| Arms span (cm) | 178 (170÷184) | 175 (168÷180) | 0,07 |
| SI (pack/year) | 0 (0÷0,625) | 0 (0÷0,3) | 0,57 |
| **Fractures, perperson** | 0 (0÷1) | 0 (0÷0) | **<0.0001** |
| **Magnesium Deficiency Questionnaire, points** | 14 (8÷20) | 10 (5÷15) | **<0.0001** |
| **ASI, points** | 47 (37÷57) | 41 (34÷51) | **<0.0001** |
| **Backpain, VAS points** | 2 (0÷5) | 0 (0÷2) | **<0.0001** |
| **Jointpain, VAS points** | 0 (0÷3) | 0 (0÷1) | **<0.0001** |

# CONCLUSION

- Thus, a significant predominance of individuals with fractures in the UCTD group was revealed.

-  Hand, foot, facial skull and radial bones fractures were most often associated with phenotypic signs of UCTD.

- Multiple positive correlations of UCTD signs and fractures of various localizations suggest primarily reduced bone strength in UCTD-positive persons.

-  Fractures prevention strategy for the young adults with UCTD is yet to be developed.