INTRODUCTION: Skeletal dysplasia is a heterogeneous group of diseases leading to abnormal enchondral ossification and typing is quite complicated. C-type natriuretic peptide (CNP) has been proven to be effective in bone development. CNP levels were found high in some of the skeletal dysplasia types.

OBJECTIVE: ✓ To evaluate the possibility that CNP, which is effective in bone development, can be used as a marker for skeletal dysplasia types ✓ To investigate the role CNP on categorizing the types of skeletal dysplasia

METHOD: Inclusion Criteria ➢ >6 months - <18 years Exclusion Criteria • Growth Hormone Treatment • Systemic disease finding causing organ failure • Skeletal dysplasia with organ involvement and mental retardation • Diagnosed with Ostegenesis Imperfecta

January 2017- May 2017 Patient Group: N = 37 Control Group: N = 49 All Subjects • CNP (ng/ml) (ELISA method / EDTA blood samples at -80 °C) Patient Group • Bone surveys • IGFBP, IGF-1 levels and SD • Puberty stages • Growth rate (cm/year)

Mutation Analysis in the Patient Group: FGFR3 mutation in two hypochondroplasia patients (+): • c. 1626 C>G (p.N540K) mutation • c.1626 C>G (p.N542K) mutation

FGFR3 mutation in nine achondroplasia patients (+): • c. 1138 G>A (p.G379R) mutation

FINDINGS:

**Table 1: Auxological Measurements of Patient and Control Group**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Mean ± SD (n)</th>
<th>Median [min; max]</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height SD</td>
<td>Patient</td>
<td>-5.81 ± 1.27 (n=37)</td>
<td>-5.57 [-14.73 ; 1.93]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.05 ± 0.79 (n=49)</td>
<td>0.04 [-1.21 ; 1.44]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sitting Height SD</td>
<td>Patient</td>
<td>-2.44 ± 2.25 (n=36)</td>
<td>-2.15 [ -9.72 ; 0.47]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>-0.19 ± 0.94 (n=45)</td>
<td>-0.21 [-1.75 ; 2.21]</td>
<td>0.034</td>
</tr>
<tr>
<td>Head Circ. SD</td>
<td>Patient</td>
<td>2.7 ± 3.65 (n=37)</td>
<td>0.56 [-2.63 ; 43.6]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>-0.07 ± 1.05 (n=49)</td>
<td>-0.16 [-1.47 ; 1.55]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BMI SD</td>
<td>Patient</td>
<td>1.13 ± 1.17 (n=37)</td>
<td>1.08 [-5.06 ; 4.23]</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.18 ± 1.19 (n=49)</td>
<td>0.12 [-1.95 ; 6.06]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sit.Ht./Ht. SD</td>
<td>Patient</td>
<td>5.22 ± 4.00 (n=36)</td>
<td>4.26 [-1.11 ; 14.56]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>-0.41 ± 1.17 (n=45)</td>
<td>-0.5 [-2.2 ; 2.21]</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Table 2: Auxological Measurements of Patient with Achondroplasia and Control Group**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Mean ± SD (n)</th>
<th>Median [min; max]</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height SD</td>
<td>Ach.</td>
<td>-5.81 ± 1.27 (n=37)</td>
<td>-5.57 [-14.73 ; 1.93]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.05 ± 0.79 (n=49)</td>
<td>0.04 [-1.21 ; 1.44]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sitting Height SD</td>
<td>Ach.</td>
<td>-2.44 ± 2.25 (n=36)</td>
<td>-2.15 [-9.72 ; 0.47]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>-0.19 ± 0.94 (n=45)</td>
<td>-0.21 [-1.75 ; 2.21]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Head Circ. SD</td>
<td>Ach.</td>
<td>2.7 ± 3.65 (n=37)</td>
<td>0.56 [-2.63 ; 43.6]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>-0.07 ± 1.05 (n=49)</td>
<td>-0.16 [-1.47 ; 1.55]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BMI SD</td>
<td>Ach.</td>
<td>1.13 ± 1.17 (n=37)</td>
<td>1.08 [-5.06 ; 4.23]</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.18 ± 1.19 (n=49)</td>
<td>0.12 [-1.95 ; 6.06]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sit.Ht./Ht. SD</td>
<td>Ach.</td>
<td>5.22 ± 4.00 (n=36)</td>
<td>4.26 [-1.11 ; 14.56]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>-0.41 ± 1.17 (n=45)</td>
<td>-0.5 [-2.2 ; 2.21]</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Table 3: CNP (ng/ml) Comparison between Patient, Achondroplasia and Control Groups**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean ± SD (n)</th>
<th>Median [Min/Max]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNP (ng/ml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ach.</td>
<td>1.87 ± 1.6 (n=17)</td>
<td>1.79 [0.31 ; 6.59]</td>
</tr>
<tr>
<td>Patient</td>
<td>1.31 ± 1.4 (n=37)</td>
<td>0.42 [0.31 ; 6.59]</td>
</tr>
<tr>
<td>Control</td>
<td>1.04 ± 1.4 (n=49)</td>
<td>0.31 [0.31 ; 5.72]</td>
</tr>
</tbody>
</table>

* There isn’t any difference on the CNP (ng/ml) between the Patient group and Control group (p=0.20), whereas in the achondroplasia group, CNP (ng/ml) was found to be high (p=0.032).

**Table 4: Types of skeletal dysplasia and CNP (ng/ml)**

<table>
<thead>
<tr>
<th>Types of Skeletal Dysplasia</th>
<th>N (%)</th>
<th>Mean ± SD</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achondroplasia</td>
<td>17(45.9%)</td>
<td>1.79 ± 1.64</td>
<td>1.87 ± 1.40</td>
<td>0.31</td>
<td>6.59</td>
</tr>
<tr>
<td>Spondyloepiphyseal dysplasia</td>
<td>6 (16.2%)</td>
<td>1.08 ± 1.03</td>
<td>0.60 ± 0.55</td>
<td>0.31</td>
<td>2.78</td>
</tr>
<tr>
<td>Metaphyseal dysplasia</td>
<td>5(13.5%)</td>
<td>1.02 ± 1.53</td>
<td>0.31</td>
<td>3.76</td>
<td></td>
</tr>
<tr>
<td>Epiphyseal dysplasia</td>
<td>3(8.5%)</td>
<td>0.31 ± 0.01</td>
<td>0.31</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Hypochondroplasia</td>
<td>2(5.4%)</td>
<td>0.54 ± 0.32</td>
<td>0.31</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Chromosomal dysplasia</td>
<td>1(2.7%)</td>
<td>0.31 ± 0.01</td>
<td>0.31</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>4(10.8%)</td>
<td>1.07 ± 1.04</td>
<td>0.73</td>
<td>0.76</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: There wasn’t any difference between patient and healthy CNP levels but CNP levels were higher in achondroplasia patients. Extensive clinical trials and studies of detailed molecular genetic analyses are needed in order to use plasma levels of CNP as a marker for the diagnoses and typing of skeletal dysplasias.