RELATIONSHIP BETWEEN KNEE KINAESTHESIA AND JOINT POSITION SENSE IN HEALTHY CHILDREN

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INTRODUCTION

Joint kinaesthesia (JK) and joint position sense (JPS) are two techniques commonly used for testing proprioception of the knee joint (Corrigan et al 1992). The two proprioceptive tests have been shown to elicit different responses in the same group of subjects (Friden et al 1997). Moreover, in adults, lack of correlation has been observed between the two tests (Grob et al 2002). It is currently unknown whether, in children, similar disparities are evident in the relationship between the two techniques. Therefore, this issue was examined in healthy children.

METHODS

Thirty-seven healthy children (mean age 11.5 ± SD 2.6 years) participated in this investigation. The study was approved by the City of Edinburgh Council Education Department and Queen Margaret University College Ethics Committee. Informed written consent was obtained from the participants and their parents. Knee JK was assessed at 60 degrees of knee flexion and JPS was examined at both 25 and 10 degrees of knee flexion using a motorised proprioception assessment device. JK was calculated as the threshold for passive movement while absolute angular error (AAE) was calculated as the difference between the target and perceived angles for JPS tests. Spearman Rho Correlation analysis was used to determine the relationship between the measures of proprioception.

RESULTS AND DISCUSSION

In Table 1 the findings of this study demonstrated a weak correlation between JK and the JPS test at 25⁰. A slightly stronger and statistically significant relationship was found between JK and JPS at 10⁰. A weak negative correlation was observed between JPS tests at the two test angles.

Table 1: Spearman Correlation between proprioceptive measures

<table>
<thead>
<tr>
<th>Variables</th>
<th>r values</th>
<th>p values</th>
</tr>
</thead>
<tbody>
<tr>
<td>JK at 60⁰ and JPS 25⁰</td>
<td>0.150</td>
<td>0.374</td>
</tr>
<tr>
<td>JK at 60⁰ and JPS 10⁰</td>
<td>0.385</td>
<td>0.019*</td>
</tr>
<tr>
<td>JPS at 25⁰ and 10⁰</td>
<td>-0.116</td>
<td>0.495</td>
</tr>
</tbody>
</table>

r = Spearman correlation coefficient; *statistically significant at α<0.05.

(JK = joint kinaesthesia; JPS = joint position sense).
SUMMARY/CONCLUSIONS

The relationship between JK and JPS was examined in healthy children in this study. The findings indicate no strong correlation between these two proprioceptive measures. Given the results of the present investigation, the findings of one proprioceptive test in children cannot be substituted for the other. Clinicians are to be aware of this and should not make clinical judgement based on independent tests of either joint kinaesthesia or position sense. Therefore, these findings provide justification for continual use of both tests for knee proprioception assessment as they are assessing two different proprioceptive systems, both of which might be important for normal function.

REFERENCES