PAEDIATRIC RHEUMATOLOGY

PATTERN OF JOINT INVOLVEMENT IN CHILDREN WITH LYME ARTHRITIS

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SUMMARY

Following the clinical observation of a peculiar joint pattern in children with Lyme arthritis, we classified the pattern of joint involvement in children with oligoarticular arthritis (2–4 joints) of different causes, including Lyme arthritis, juvenile chronic arthritis and juvenile spondyloarthropathy, as: (1) symmetrical: arthritis of the same joints on both sides of the body; (2) unilateral: all involved joints on the same side; (3) predominantly unilateral: joints involved on the contralateral side also showed ipsilateral involvement; (4) oblique: involvement on the contralateral side of one or more joints that did not show ipsilateral involvement. The oblique pattern was found in 13 of 42 children with early-onset pauciarticular juvenile chronic arthritis and in 17 of 32 patients with juvenile spondyloarthropathy, but not in 32 of 32 children with Lyme arthritis. If confirmed, these results may have implications for the diagnosis and pathogenesis of Lyme arthritis.

KEY WORDS: Lyme arthritis, Laterality, Joint pattern, Oblique joint pattern, Juvenile arthritis.

PATIENTS with arthritis are usually classified as having monoarticular, oligoarticular or polyarticular disease. Symmetrical polyarthritis is typical of rheumatoid arthritis, the most common chronic inflammatory joint disease in adults [1]. The oligoarthritis most common in children is often described as asymmetrical [2]. When examining a group of children and adolescents with Lyme arthritis, a frequent cause of arthritis in German children and adolescents, we found symmetrical and asymmetrical oligoarthritis, but asymmetrical arthritis showed a strong laterality: joint involvement was predominantly on one side of the body and if a joint on the contralateral side was involved it also showed ipsilateral involvement [3].

In order to assess whether this observation was valid, we examined a larger group of patients with oligoarticular Lyme arthritis and compared these patients to children with other causes of oligoarthritis.

PATIENTS, MATERIAL AND METHODS

Lyme arthritis was diagnosed if the history and presentation were compatible with this diagnosis, if the beginning of arthritis was before 16 yr of age, if other causes of arthritis were excluded and if a positive ELISA for IgG antibodies to Borrelia burgdorferi was confirmed by immunoblot [3, 4].

Oligoarthritis was defined by the presence of 2–4 inflamed joints during the first year of illness and called symmetrical if the same joints were involved on both sides of the body, unilateral if all involved joints were on one side of the body, predominantly unilateral if a joint involved on the contralateral side also showed ipsilateral involvement, and oblique if there were one or more joints involved on the contralateral side that did not show ipsilateral involvement. Examples of the different joint patterns can be found in Fig. 1.

Among 109 children and adolescents found within a national study on paediatric Lyme arthritis in 1991–1994, 62 of whom have been published before [3], there were 70 with monoarthritis, seven with polyarthritis and 32 with oligoarthritis.

Control patients with oligoarthritis were obtained without selection from our files by a person unaware of the purpose of this study and belonged to one of the two main groups of chronic arthritis in childhood. There were 42 children with early-onset pauciarticular juvenile chronic arthritis (EOPA) [5], 19 from the Würzburg centre and 23 from the Garmisch-Partenkirchen centre. The second group comprised 32 patients with juvenile spondyloarthropathy (JSpA) [6].

Oligoarthritis started before 16 yr of age. Twenty of these patients were from Würzburg and 12 from Garmisch-Partenkirchen. All control patients had been seen by the authors in routine clinical care during a period of at least 12 months in 1991–1994. None of them had antibodies to B. burgdorferi or a preceding erythema migrans.

Statistics were performed with the kind help of Wassilios Bentas at the Rechenzentrum, University of Würzburg, using the MEDAS medical statistics programme.

RESULTS

Clinical details of the three groups of patients were characteristic of their respective diseases (Table I). As expected, and in contrast to patients with JSpA, patients with EOPA were young, predominantly female, ANA positive and HLA B27 negative. The
Clinical and laboratory data of patients with Lyme arthritis (LA), early-onset pauciarticular juvenile chronic arthritis (EOPA) and juvenile spondyloarthropathy (JSpA)

<table>
<thead>
<tr>
<th></th>
<th>LA (n = 32)</th>
<th>EOPA (n = 42)</th>
<th>JSpA (n = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at onset</td>
<td>10.8 (2.3-15.8)</td>
<td>2.4 (1.1-5.6)</td>
<td>11.4 (7.0-16.0)</td>
</tr>
<tr>
<td>Sex [n (% male)]</td>
<td>19 (59)</td>
<td>8 (19)</td>
<td>23 (72)</td>
</tr>
<tr>
<td>Average number of joints with arthritis during the first year of illness</td>
<td>2.59</td>
<td>2.69</td>
<td>2.84</td>
</tr>
<tr>
<td>n (%) antinuclear antibody positive</td>
<td>5*</td>
<td>39</td>
<td>1</td>
</tr>
<tr>
<td>n (%) HLA B27 positive</td>
<td>(16)</td>
<td>(93)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Comparison of patients with Lyme arthritis and those with other causes of oligoarthritis for the presence of an oblique or not oblique pattern of arthritis: $P(x^2) < 0.001$.

Pattern of joint involvement in patients with oligoarthritis

<table>
<thead>
<tr>
<th></th>
<th>LA (n = 32)</th>
<th>EOPA (n = 42)</th>
<th>JSpA (n = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symmetrical</td>
<td>8</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Unilateral</td>
<td>15</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Predominantly unilateral</td>
<td>9</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Oblique $P(x^2) &lt; 0.001$</td>
<td>0</td>
<td>13</td>
<td>17</td>
</tr>
</tbody>
</table>

Scanning the literature on rheumatic diseases, there is a paucity of studies and theories: it remains totally unclear why certain joints are involved in certain diseases, including individual joints, joint patterns and the presence of oligoarticular or polyarticular disease. If our unusual clinical observations are confirmed by other groups, they might have important implications for diagnosis and prognosis. Moreover, they might contain intriguing aspects of the pathogenesis of Lyme arthritis; in addition to immunological mechanisms, anatomical peculiarities could modify the bacteremic or regional neurogenic spread of the disease.

ACKNOWLEDGEMENTS

H-IH is extremely grateful to his paediatric rheumatology colleagues in Germany who made this study possible by sending data and body fluids of their patients with Lyme arthritis, among them most prominently Dr A. Thon (Hannover), Dr E. Döring (Berlin), Dr H. J. Suschke (Munich) and Dr G. Ganser (Sendenhorst).
REFERENCES


