Psychological functioning of children and adolescents with juvenile idiopathic arthritis is related to physical disability but not to disease status

T. Ding¹, A. Hall¹, K. Jacobs² and J. David¹

Objectives. This study investigates the psychological functioning of children with polyarticular joint disease and its association with disease activity and disability.

Methods. Sixty children aged 7–18 yrs with juvenile idiopathic arthritis and >4 joints involved were recruited. Children underwent a physical examination. The Childhood HAQ was completed by both the children and their parents. Children also completed questionnaires for depression (Birleson Depression Inventory; BDI), anxiety (Revised Children’s Manifest Anxiety Scale; RCMAS) and peer, emotional and behavioural problems (Strenghts and Difficulties Questionnaire; SDQ). Clinical information was extracted from the hospital records.

Results. Self-reported psychological functioning (depression, anxiety, and behaviour) was not different from the normal population. Parent-reported emotional difficulties on the SDQ were somewhat elevated. There were no significant correlations between psychological functioning and physician-rated disease activity score or the number of active joints at the time of assessment. Furthermore, no differences in psychological functioning were found between children with or without significantly raised inflammatory markers. All aspects of psychological function (depression, anxiety and behaviour) correlated moderately with physical function ($r = 0.49, 0.41, 0.46$, respectively; all $P < 0.01$).

Conclusions. Children and adolescents with polyarthritis are not at significantly elevated risk of psychological difficulties. Poor psychological outcome was associated with more severe physical disability but not with the level of disease activity.

Key words: Juvenile idiopathic arthritis, Physical function, Psychological function, Childhood HAQ, Disease activity.

Introduction

Juvenile idiopathic arthritis (JIA) is the most common chronic paediatric rheumatic disease, affecting ~10 children/100,000 in the UK [1]. Children with JIA commonly experience acute and chronic pain, decreased mobility, joint stiffness, growth retardation, visual problems, frequent visits to the doctor, restrictions on activities and school absenteeism. It is recognized that sole reliance on clinical signs, symptoms and physician assessment of disease outcome is inadequate for understanding the impact of the illness and its treatment on a child’s life and functioning. There is a need for a multi-disciplinary and holistic approach to children with arthritis which considers both physical and emotional functioning [2]. Although it is generally accepted that increasing physical disability is associated with an increased incidence of depression and anxiety in adults with RA [3, 4], there is no consensus in children with arthritis as to the impact of illness upon their psychological adjustment [5] or its relationship with physical function. A recent review by Rapoff et al. [6] concluded that the majority of published studies have found no significant psychosocial deficits in children with JIA compared with normative or healthy control samples.

It is known that social support and family cohesion are associated with psychological functioning in children with chronic health conditions such as JIA, while the relationship among disease status, disability and psychological functioning is a lot less clear. Stein and Jessop [7] found a modest correlation between psychological adjustment and functional status. However, two further studies failed to demonstrate a positive correlation between physical disability and psychological dysfunction [8, 9]. These contradictory findings may reflect the differences in the methodology across studies with different functional and psychological tools. Moreover, most of these studies have small heterogeneous groups of children with varying numbers of joint involvement (i.e. a mixture of oligoarticular and polyarticular disease), which makes comparison between studies difficult. Furthermore, few studies have tried to delineate the specific domains in which children with arthritis have adjustment difficulties as most studies tend to use general and global ratings of adjustment. A subject may be impaired in discrete areas of psychopathology without necessarily obtaining a high total problem score.

In order to overcome some of the shortcomings of previous studies, we undertook a cross-sectional study of a homogeneous group of children with polyarticular joint involvement (>4 joints). More severe functional disabilities are found in children with arthritis of systemic onset, polyarthritis and extended oligoarthritis, and they are therefore thought to be at higher risk of psychological morbidity. Disease status, physical functioning and their relationship with a number of aspects of the children’s psychological functioning (depression, anxiety, prosocial behaviour and behaviour problems) were examined. Our study aims to increase understanding of how functional impairment and more objective measures of disease activity relate to children’s behaviour and emotions in this high-risk group.

Patients and methods

Patients

Children and adolescents between the ages of 7 and 18 yrs with a diagnosis of JIA for at least 6 months, having five or more joints affected were recruited between April 2004 and July 2004. School age was chosen as this is a crucial period of a child’s development. The patients attended the rheumatology service at the Oxford Centre for Paediatric and Adolescent Rheumatology (OXPARC). Local ethics committee approval was obtained. Parents and children (the term ‘children’ will be used to describe both children and adolescents) were given separate written information about the study. Children who are 16 yrs or older were asked for their consent; and for those younger than 16 yrs of age, parents were consent; and for those younger than 16 yrs of age, parents were
asked to sign a consent form and the children provided verbal assent. Both parents and the children were given a number of questionnaires to fill out. Children and their parents filled in the questionnaires simultaneously but in separate rooms. A physical and psychological function evaluation as well as a clinical assessment was performed. The entire interview process took around 20 min.

**Disease activity**

Disease activity was measured in three ways: active joints count, visual analogue score and serological markers of inflammation. The number of active joints was assessed out of a total of 64 joints (the joints that are included in our routine clinical evaluation) and calculated as reported previously [10]. A joint was defined as active if it met the following criteria: (i) swelling alone, or (ii) a combination of joint tenderness and limitation of movement. Active joint count has been used previously as a measure of JIA disease activity [11]. A global physician-rated assessment of disease activity was obtained at the time of the clinic visit. Physician-rated global assessment was recorded on a 10 cm visual analogue scale (VAS). While 0 represented no disease activity, 10 represented very severe disease activity. In 1997, the VAS physician global assessment was chosen as part of the core set of outcome variables for clinical studies of juvenile arthritis [12]. Recent (within the previous month) serological markers of inflammation such as ESR (Westergren method) and/or CRP were available in 42 patients. We chose a cut-off level of ESR >25 mm/h and CRP >30 mg/dl as a significant level of inflammation.

The patient’s clinical notes were reviewed to gather information on his or her age, sex, the age of disease onset, disease duration, eye involvement, JIA onset subtype, current DMARD treatment, usage of NSAIDs and ongoing steroid treatment.

**Measurement of physical disability**

Parents rated their child’s and children rated their own disease-related functional status using the parent-report and the child-report versions, respectively, of the Child HAQ (CHAQ) [13]. Both versions yield a disability index score (0–3) and a discomfort index score (0–10). The CHAQ is the most widely used measure of physical function in clinical and research settings. It has good validity and reliability [14]. One minor alteration was made to some of the items to make them more acceptable to a British population, e.g. ‘faucet’ was changed to ‘tap’.

**Measurement of psychological function**

The Birleson Depression Inventory (BDI), Revised Children’s Manifest Anxiety Scale (RCMAS) and Strengths and Difficulties Questionnaires (SDQ) were used to assess the three main aspects of a child’s psychological function: depression, anxiety and behaviour.

The BDI was developed as a clinical instrument to be used in children and adolescents (aged 7 or over) to assess the degree of depressive feelings [15]. It is thought to make fewer demands on cognitive abilities than the Children’s Depression Inventory (CDI) [16] and is therefore more suitable for use in pre-adolescents. The score ranges from 0 to 36. Its items are worded in a child-friendly way that also covers the commonest symptoms of depression reported in children. It has been validated and correlates with other measures of depression such as the CDI [16–18]. Reliability and validity were established in psychiatric inpatients [17] and non-clinical samples [16].

The RCMAS is a widely used self-report inventories of anxiety designed to assess the level and nature of anxiety in children and adolescents aged 6–19 yrs. It is a 37-item self-report inventory for clinical or research purposes [19]. The RCMAS consists of 28 anxiety items divided into three subscales (Physical Anxiety, Worry/Over-sensitivity and Social Concerns/Concentration) and nine Lie items. Each item represents a feeling or action that reflects an aspect of anxiety, hence the subtitle, ‘What I think and Feel’. In this study, the modified RCMAS was used excluding the nine Lie items as some of these items were felt to be unsuitable for young children. Each of the 28 anxiety items is given a score of 1 for an ‘yes’ response, yielding a total anxiety score [20, 21]. The RCMAS has adequate reliability and validity data to support its use in school-age children. Muris et al. [20] reported strong correlations between RCMAS and four other widely used anxiety measures. Reliability and validity of the RCMAS have also been extensively reviewed in Southam-Gerow and Chorpita [22].

The SDQ is a widely used, brief behavioural screening questionnaire that can be completed by the parents or teachers of children aged 4–16 and there is a self-report version for 11- to 16yr olds [23]. The scores of the English version correlate with those of the considerably longer Child Behaviour Checklist (CBCL) [24]. It addresses 25 positive and negative behavioural attributes of children or adolescents. The 25 items are divided between five scales of five items each. It generalizes scores for conduct problems, hyperactivity, emotional symptoms, peer problems and pro-social behaviour. All but the last are summed to generate a ‘total difficulties’ score. The SDQ has been extensively validated in 10,438 British school children aged 3–16yrs [25] and in 562 normal Dutch children [26].

The psychological assessments included information from the child only except for SDQ used in behaviour assessment where separate reports from parent and child were obtained.

**Statistical analysis**

For assessment of differences between groups, Wilcoxon matched-pairs signed ranks test was used. Univariate associations were expressed as Spearman correlation coefficients ($r_s$) due to the non-normal distribution of disease variables and the Kruskal-Wallis test was used when there were more than two variables. In all analyses, $P \leq 0.05$ was considered to be statistically significant. All calculations were performed using the statistics package SPSS for Windows (SPSS, Chicago, IL, USA).

**Results**

**Demographic and clinical features**

All children and their parents who were approached agreed to take part in the study and the final study sample comprised 60 children. The sample consisted of 21 (35%) boys and 39 (65%) girls. The ages ranged from 7 to 18 yrs (mean = 12.3, s.d. = 2.8).

The JIA subsets that are included in this study group are extended oligoarticular JIA, polyarticular JIA (RF positive/negative), juvenile SpA, juvenile PsA and juvenile systemic arthritis, classified according to the revised World Health Organization ILAR classification [27] (Table 1). The mean age at disease onset was 6.4 yrs (range 1–16yrs). The average disease duration for the children in the sample was about 6 yrs (range 6 months–14yrs). Seven children (12%) also had uveitis.

Forty (65%) patients were receiving NSAIDs. Forty-four patients (77%) were taking DMARDs, of whom 32 (53%) were receiving MTX, 4 (7%) were receiving SSZ, 3 (5%) were receiving combination of MTX and HCQ and 2 (3%) were receiving combination of etanercept and MTX. One patient (2%) was on LEF, one patient on SSZ and one patient on the combination of MTX and CsA. Four patients (7%) were taking oral corticosteroids and six patients (27%) were not receiving any DMARD.

Parent-perceived CHAQ (CHAQ-P), child-perceived CHAQ (CHAQ-C), pain score, depression, anxiety and the SDQ total scores (all using the Spearman’s correlation two-tailed test) were
scored/C21

sample to the Swedish normative sample, it would seem that levels non-depressed children [28]. Comparing the results of our JIA study. The highest 10% of Ivarsson and Gillberg's non-psychiatric because a larger sample size was included than that in the original

four cases (6.7%) only, and

10% in the

Table 4. Differences in psychosocial functioning, disability and physician VAS between children with and without significantly raised inflammatory markers, i.e. ESR over 25 mm/h and/or CRP >30 mg/dl

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean (s.d.)</th>
<th>Significance</th>
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<tbody>
<tr>
<td>SDQ total score - parent</td>
<td>42</td>
<td>11.19 (6.6)</td>
<td>NS</td>
</tr>
<tr>
<td>Raised ESR or CRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal ESR or CRP</td>
<td>18</td>
<td>9.33 (5.6)</td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>42</td>
<td>8.74 (6.3)</td>
<td>NS</td>
</tr>
<tr>
<td>Raised ESR or CRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal ESR or CRP</td>
<td>18</td>
<td>6.83 (4.1)</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>42</td>
<td>7.36 (4.7)</td>
<td>NS</td>
</tr>
<tr>
<td>Raised ESR or CRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal ESR or CRP</td>
<td>18</td>
<td>6.33 (3.8)</td>
<td></td>
</tr>
<tr>
<td>CHAQ - parent</td>
<td>42</td>
<td>6.01 (0.6)</td>
<td>NS</td>
</tr>
<tr>
<td>Raised ESR or CRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal ESR or CRP</td>
<td>18</td>
<td>1.10 (0.9)</td>
<td></td>
</tr>
<tr>
<td>CHAQ - child</td>
<td>42</td>
<td>0.56 (0.7)</td>
<td>P &lt; 0.05</td>
</tr>
<tr>
<td>Raised ESR or CRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal ESR or CRP</td>
<td>18</td>
<td>0.99 (0.8)</td>
<td></td>
</tr>
<tr>
<td>Physician VAS</td>
<td>42</td>
<td>15.76 (19.9)</td>
<td>P &lt; 0.001</td>
</tr>
<tr>
<td>Raised ESR or CRP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal ESR or CRP</td>
<td>18</td>
<td>50.89 (26.0)</td>
<td></td>
</tr>
</tbody>
</table>

unrelated to sex, age (either current or age at the disease onset) and disease duration (Table 2).

Psychological functioning

The BDI. The median Birleson depression score was 6 and the
group mean was 10.6. The Birleson depression score was ≥14 in
cases (6.7%) only, and ≥17 in two cases (3.3%). We use the
Ivarsson and Gillberg’s [16] normative Swedish sample as control,
because a larger sample size was included than that in the original
study. The highest 10% of Ivarsson and Gillberg’s non-psychiatric
sample (n = 524) scored ≥14. The highest 5% of their sample
scored ≥17. In the original Birleson study, a cut-off score of ≥13 was suggested as distinguishing reliably between depressed and non-depressed children [28]. Comparing the results of our JIA sample to the Swedish normative sample, it would seem that levels of depression are not elevated compared with the general population.

The RCMAS. Higher RCMAS scores are indicative of increased anxiety. A cut-off score of 19 is recommended in order to identify children experiencing clinically significant levels of anxiety [29]. Only two children (3.3%) were considered to have significant elevations on the total anxiety scale of the RCMAS. It would, therefore, seem that the JIA sample did not have significantly elevated anxiety levels.

SDQ. The parent version of SDQ questionnaire was completed by all participants and the self-report SDQ was completed by children aged ≥11.

Although SDQ scores may be used as continuous variables, it is sometimes more convenient to classify scores as normal, borderline and abnormal. Abnormality in the total difficulties score and one or more subcategories can be used to identify patients with mental health disorders. Approximately 10% of a community

<table>
<thead>
<tr>
<th>Number (%) of patients or mean (s.d.)</th>
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<tbody>
<tr>
<td>Disease subtypes</td>
</tr>
<tr>
<td>Systemic</td>
</tr>
<tr>
<td>Polyarticular (RF positive)</td>
</tr>
<tr>
<td>Polyarticular (RF negative)</td>
</tr>
<tr>
<td>Extended oligoarticular</td>
</tr>
<tr>
<td>Psoriatic</td>
</tr>
<tr>
<td>Enthesis related</td>
</tr>
<tr>
<td>Disease activity variables</td>
</tr>
<tr>
<td>ESR &gt;25 mm/h or CRP &gt;30 mg/dl (n = 42)</td>
</tr>
<tr>
<td>Physician global assessment of disease activity (10 cm VAS)</td>
</tr>
<tr>
<td>Number of active joints (n = 60)</td>
</tr>
<tr>
<td>Number of children with ≤5 active joints</td>
</tr>
<tr>
<td>Number of children with &gt;5, ≤10 active joints</td>
</tr>
<tr>
<td>Number of children with &gt;10 active joints</td>
</tr>
</tbody>
</table>

Table 2. Summary of the correlations (Spearman’s r) between demographic features of participants and psychological function

<table>
<thead>
<tr>
<th>Correlation with current age (r)</th>
<th>Correlation with age of disease onset (r)</th>
<th>Correlation with disease duration (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDQ parent</td>
<td>-0.19</td>
<td>0.08</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-0.16</td>
<td>-0.08</td>
</tr>
<tr>
<td>Depression</td>
<td>-0.20</td>
<td>-0.11</td>
</tr>
</tbody>
</table>

Table 3. Percentage of abnormal scores of parent- and adolescent-reported SDQ scores in different sub-categories

<table>
<thead>
<tr>
<th></th>
<th>Normative population (%)</th>
<th>Parent score (n=60) (%)</th>
<th>Adolescent score (n=41) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDQ total</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>SDQ emotional</td>
<td>10</td>
<td>37</td>
<td>12</td>
</tr>
<tr>
<td>SDQ behaviour</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>SDQ hyperactivity</td>
<td>10</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>SDQ peer problems</td>
<td>10</td>
<td>18</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 4. Differences in psychosocial functioning, disability and physician VAS between children with and without significantly raised inflammatory markers, i.e. ESR over 25 mm/h and/or CRP >30 mg/dl

Measures of disease activity

Table 1 contains a summary of results for variables of disease activity including: inflammatory markers, physician’s global assessment of disease activity and active joint count. It is worth noting that a significant proportion of the children had inactive disease at the time of assessment. Twenty-two (37.7%) had no active joints while 48 (80%) had five or less active joints. Both active joint count and the physician VAS of overall disease activity correlated with the CHAQ-C (r = 0.27, P = 0.04 and r = 0.39, P < 0.01, respectively). There was no relationship between the active joint count or physician’s global assessment of disease activity with any of the psychological outcome variables.

Multiple t-tests were performed in order to examine whether those children with significantly raised CRP and/or ESR displayed poorer psychological functioning than those without (Table 4). The results showed that there were no differences between those children with and without significantly raised CRP and/or ESR. This would suggest that short-term inflammation does not significantly affect a child’s psychosocial functioning.
Raised inflammatory markers were also not associated with physical disability as perceived by the parent, but did reach significance for physical disability as perceived by the child (r = −2.19; df = 58) and for physician’s global assessment of disease activity (r = 5.79; df = 58), as one would expect. Interestingly, children without significantly raised inflammatory markers rated themselves higher in terms of disability than the group that did. Overall, it would seem that physician VAS, number of active joints or inflammatory markers were not associated with the child’s psychological functioning.

Level of physical disability

The overall level of physical disability of the patients is shown in Table 5. The mean disability index (CHAQ) as reported by parents was 0.76 (s.d. = 0.76), similar to reports in previous studies [13]. CHAQ-P was highly correlated with CHAQ-C with a Spearman’s correlation coefficient of 0.86 (P < 0.01). There was no significant difference between the means of CHAQ-P and CHAQ-C using the Wilcoxon signed ranks test (P = 0.25). Correlations between level of physical disability and psychological functioning are shown in Table 6.

There was a positive correlation between the CHAQ-C and the Birleson depression score (r = 0.47, P < 0.01) and between the CHAQ-C and the total anxiety score (r = 0.41, P < 0.01) (using the Spearman’s correlation two-tailed test). There was also a positive correlation between the SDQ-P and SDQ-C (r = 0.60, P < 0.01). SDQ-P correlated with both the CHAQ-P (r = 0.56, P < 0.01) and the CHAQ-C (r = 0.46, P < 0.01). It would seem therefore that psychological functioning is moderately associated with physical disability.

Discussion

This study investigated the psychological functioning of children and adolescents with polyarthritis and the relationship between psychological functioning, disease activity and physical disability. All the children in the study had multiple joint (>4) involvement and attended a tertiary centre. Our findings confirm that children and adolescents with polyarthritis face the same level of psychological difficulties as children and adolescents in the normal population and that psychological functioning is associated with physical disability but not with disease activity.

Although there were six children (10%) who had CHAQ score ≥2 (i.e. in the range of severe physical disability), the mean CHAQ score for the cohort was only 0.76. This suggests on average that the children that were included in the study were experiencing mild to moderate disability. This overall good physical functioning reflects improved treatment, in particular, the use of MTX therapy. Contrary to the finding by Ennett et al. [30], we found that the mean CHAQ scores (both disability index and the discomfort index) for parents and children were not different and were highly correlated. Good levels of agreement between parents and children in the assessment of function have been reported previously [9, 13]. Children and adolescents can therefore reliably and accurately answer questions regarding their disability in a clinical setting.

Children and adolescents with polyarthritis in this study were not at risk of significantly elevated self-reported psychological difficulties. This study, therefore, confirms the finding from most of the existing studies summarized in the review by Rapoff et al. [6]. Children with JIA are resilient to psychological difficulties, in the face of fluctuating and unpredictable levels of pain, disease activity and disability. Disease-related factors do not appear to affect JIA children’s psychological health. In a study of 72 school-aged children with JIA, Vandvik [31] found that 51% met the criteria of a Diagnostic and Statistical Manual of Mental Disorders (DSM-III) diagnosis, particularly dysthymic disorders and separation anxiety, early in the course of their disease. Children would therefore seem to be vulnerable early on following the diagnosis, but adapt in the longer term. Parents also play an important role in the adaptation process as shown in the meta-analysis by Lavigne and Faier-Routman [32]. Their results demonstrated that maternal adjustment, marital and family adjustment, family support and cohesiveness were associated with child adjustment.

Self-reports of anxiety, depression and behaviour did not show an elevated risk of maladjustment, but parental reports of emotional symptoms on the SDQ did. It is not clear whether this discrepancy is meaningful. It may indeed be the case that parents are more sensitive to their children’s emotional reactions, but future research will be needed to determine this.

Psychological functioning was related to physical disability, but not to disease activity. Similar results were also noted by Jacobs [33] and Fuhrer et al. [34]. In a study of young men with severe head injuries, psychological well-being and adjustment were found not to be associated with post-traumatic amnesia (severity) or to cognitive impairments, but were highly related to self- and carer-reported impairments and disabilities [33]. Fuhrer et al. [34], after failing to find a relationship between severity of injury and life satisfaction and adjustment in a sample of people with spinal cord injury, suggested that because life satisfaction and adjustment are further away in the causal flow of the WHO model of disease (from pathology to impairment to disability to handicap) weaker associations would be expected. Traditional coping models as proposed by Lazarus and Folkman [35] and Lazarus [36] may also provide an explanation of the results. Coping models invoke a process of ‘primary appraisal’ in order to determine ‘a threat to oneself’ [37]. Secondary appraisal concerns the perception of ‘loss, threat and challenge’ [38]. Lazarus’ and Folkman’s model suggests that the appraisal the person makes of their medical condition is central to adjustment, because a medical condition cannot be a crisis until it is considered as such by the patient. Temporary illness-related factors, such as inflammation, painful affected joints are not perceived as a difficulty. On the other hand, physical disabilities, which are likely to be more chronic and have a bigger impact on the child’s daily life, are considered a long-term threat and are therefore more likely to affect the child’s psychological functioning. Finally, it is likely that level of physical disability is not just influenced by the disease severity, but also by other factors, including the child’s psychological state and parental reactions. There is no such relationship between disease activity and these factors.

The main strength of our study is its use of reports from both parents and children obtained using valid and reliable measures of physical and psychological function in a homogeneous group of children with polyarthritis. Some of the limitations of the study are the inclusion of children who had only mild to moderate...
levels of pain and disability, and the inclusion of children who were all attending the same rheumatology clinic. As a result, one should be cautious in generalizing the results of this study to children receiving treatment in other settings and to children with more severe pain and disability. The correlation and cross-sectional design of this study preclude one from drawing firm causal inferences from these results, in particular, the important relationship between psychological adjustment and physical functional status. This question may be addressed in analyses of longitudinal data. It is not clear whether functional status produces effects on the child’s psychological adjustment or the child’s psychological adjustment produces alterations in function, or whether both are reciprocally related.

It has been argued that more holistic approaches for all JIA children are unnecessary and too costly. In this study, we have confirmed that the CHAQ and the questionnaires used to assess psychological function were simple and quick to administer and accepted and appreciated by patients and their families. As such there are no practical difficulties in using it routinely in clinical practice, in particular, for those children in the high-risk group (e.g. children with polyarticular arthritis, poor physical function, high pain score), to identify psychological adjustment problems. Appropriate psychosocial interventions can then be targeted to support these children and their parents.

### Rheumatology key messages
- Children and adolescents with polyarthritis are not at significantly elevated risk of psychological difficulties.
- Poor psychological outcome was associated with more severe physical disability but not level of disease activity.

**Disclosure statement:** The authors have declared no conflicts of interest.

**References**