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# Recurrences of transient synovitis of the hip

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SUMMARY Thirty six children with transient synovitis of the hip had a total of 80 recurrences, 69 of them personally observed, and 11 described by the mother. No features distinguished the initial attack of those who had a recurrence from that of the 18 children who have not so far had a recurrence. We analysed the total of 126 episodes. In 72 there was evidence of an associated infection from the history, clinical signs, and a raised antistreptolysin O titre or isolation of a pathogen from a throat swab. The prognosis is difficult to assess because the symptoms, signs, and special investigations are not specific. Recurrences can occur after many years without symptoms.

Many children are taken to a doctor because of the recent onset of a limp or limb pains and in a 9 month period in 1976, 123 of these children were brought to the accident and emergency department of this Hospital.[1] None of them had signs of trauma, local sepsis, hemiplegia, or any other obvious cause and 76 were thought to have transient synovitis of the hip. Over 10 years 257 children were admitted to the Royal Liverpool Children's Hospital for this condition.[2] Although transient synovitis of the hip is common, the *Index Medicus* for the past 11½ years (up to July 1982) listed less than a dozen published reports on the subject. It is a difficult condition to study because of the absence of specific symptoms or signs, the absence of specific findings on special investigation (except sometimes on radiographic examination), and the need for follow up over many years. As Sharrard wrote,[3] the diagnosis is inevitably speculative and retrospective.

Transient synovitis of the hip occurs in children aged about 18 months to 12 years, particularly in those aged 5 to 6 years and in boys, and it often follows a respiratory tract infection. Diagnosis is based on a history of onset of a limp, refusal to bear weight on a leg, or pain on movement in the knee, thigh, or hip, together with limitation of abduction and internal rotation of the hip. The symptoms may last up to 14 or 21 days. The onset may be acute and severe so that a child who is well on going to bed is unable to walk or to bear weight on the leg in the morning. It is impossible to distinguish it clinically from Perthes's disease. The causative factors commonly mentioned are infection, trauma, and allergy, and Spock[4] added obesity.

Few published reports mention recurrences: Rosenberg[5] found that of 36 children none had a recurrence; Spock[4] wrote that some children had a recurrent attack and 45 children (17·4%) described in 4 published reports suffered a recurrence.[6–9] I was unable to find any study of recurrences of transient synovitis of the hip and because we were seeing many I collected records of 36 children who had subsequent attacks and include details of 18 other patients who have not so far had a recurrence.

## Method

All 54 children (44 boys, 10 girls) seen between 1977 and mid 1982 (with 2 exceptions), satisfied the criteria described above. All had hip pain or limited movement and in many there was referred pain in the knee. All had radiographic examination of the hips to exclude Perthes's disease. Children found to have Perthes's disease at the first or subsequent examination were excluded. All had an erythrocyte sedimentation rate (ESR), white cell count, and throat swab and most had an antistreptolysin O (ASO) titre and test for C reactive protein. Where there was a possibility of rheumatoid arthritis we investigated for the rheumatoid factor by the latex method. Various studies by throat and stool culture were carried out on 33 children and a monospot test for infectious mononucleosis was done in 4 children. The mean age of the first attack in the 54 children was 6 years and 5 months and the distribution is set out in the table.

## Results

**Aetiology.** In 52 episodes (42%) the child had an upper respiratory tract infection when seen or within the previous 2 weeks. In a further 20 episodes (16%) there was evidence of infection in a high ASO titre alone (8 episodes), a positive throat swab

Table *Age distribution of first attack of synovitis of the hip in 54 children*

| *Age (years)* | *Number (%)* |
|---|---|
| 2–3 | 6 (11) |
| 4–5 | 18 (33) |
| 6–7 | 13 (24) |
| 8–9 | 10 (19) |
| 10–12 | 7 (14) |

for β haemolytic streptococci alone (7 episodes), or a positive throat swab with a raised ASO titre (5 episodes). Three children had herpes labialis (2 of them included in the above, the third without an upper respiratory tract infection).

From 4 children a β haemolytic streptococcus (Lancefield group C) was cultured (from 1 of these it was also cultured in a recurrent attack). These children were aged 6, 8, 9, and 11 years, all had an ESR under 10 mm/hour, 1 had an ASO titre of 600, and another had a titre of 1200. From 2 children a β haemolytic streptococcus (Lancefield Group G) was cultured; both had a normal ESR, the ASO titre was 600 in one and 1200 in the other, who also had diarrhoea.

Six of the 54 children had mild diarrhoea or vomiting at the time of the attack but none had a markedly raised temperature. All except 3 were otherwise well in the first and subsequent attacks. The incidence of infection was the same in first attacks and recurrences. Virological studies in all 11 patients investigated, tests for infectious mononucleosis in 4 children, and tests for C reactive protein in 31 children were all negative. The ESR was <10 mm/hour in 68%, <15 mm/hour in 78%, 16–20 mm/hour in 8%, and >21 mm/hour in 14%. The white cell count was under 15 000/μl ($15 \times 10^9$/l) in 23% and >15 000μl in 1 child. No information of value was provided by the white blood count or differential count.

Of the 30 children tested for rheumatoid factor and the antinuclear factor, 2 had a positive rheumatoid factor but were negative at follow up. The antinuclear factor was positive in a further 2. Two children had asthma or eczema. In 1 child there was patchy psoriasis with a family history of psoriasis, and in another child the father had psoriasis. It was difficult to assess the importance of trauma in this age group, especially in boys in whom vigorous pursuits are usual, but trauma may have been a factor in 3 patients.

All children had a radiographic examination of the hips on their first attendance at hospital and this was also done later if there had been doubt at the first examination. Twelve children were thought to have an abnormality—increased joint space, 'stand off', or effusion—and in 16 more an abnormality was suspected initially but later radiological findings were normal. To minimise pelvic irradiation in children who had had earlier episodes, only a throat swab and ASO titre were done and the children were reassessed after 48 hours' complete rest.

## Recurrences

The 54 children had a total of 134 episodes of synovitis of the hip: 36 children had a total of 80 recurrences after the first attack, but only 69 were personally observed and analysed by me and the other 11 diagnoses depended on the mother's history. This must not be interpreted as the recurrence rate as my interest in recurrences developed over several years when I realised how frequent they were. The staff of the department now ask me to see all children who present with unexplained limp or failure to bear weight.

A further difficulty in assessing the recurrence rate is the need for a prolonged period of follow up—1 child had almost 7 years and another $5\frac{1}{2}$ years between recurrences and 1 child had recurrences over a period of 10 years. Comparing the 36 children who have so far had a recurrence with 18 who have not, and with the 76 children previously described by me,[1] it was impossible to pick out any features that indicated that a recurrence was likely. There were no apparent differences in these children.

Recurrences were particularly common within 6 months of the first attack (43% of 70); 29% of children had their first recurrence 7 to 12 months after the first attack, 13% in the second year, and 15% later still. One child had a total of 16 episodes of which 6 were seen by me. In almost half of the children with a recurrence the same hip was affected and in 7 children other joints as well as the hip were affected (mostly with pains only and without other physical signs).

## Discussion

Limping children present a frequent diagnostic problem to accident and emergency departments and family doctors. When there is no helpful history of trauma common causes such as local infection with tender enlarged inguinal lymph nodes or local heat or tenderness somewhere in the lower limb are sought; it is necessary to determine whether the pain arises from the soft tissues, muscle, bones, or joints and the spine is examined for possible psoas spasm. When the only finding is limitation of movement of the hip joint or perhaps merely pain on moving it, especially in abduction or internal

rotation, transient synovitis of the hip or Perthes's disease—which cannot be distinguished clinically—are suspected. If radiographic examination of the hip is negative, follow up examination is important to make sure that the symptoms and signs do not represent the early stage of Perthes's disease. According to Sharrard[3] the relation between transient synovitis of the hip and Perthes's disease is still speculative. It is not known whether the adverse factors described in Perthes's disease[10] apply to transient synovitis—low family income, undersize, older parents, and a history of breech delivery or other malpresentation especially in the third or later born child—nor do we know whether there is an increased incidence of congenital anomaly of the genito-urinary tract as is said to occur in Perthes's disease.[11] As for the suggestion that children with Perthes's disease are undersized, in a preliminary study of 26 children with transient synovitis of the hip we found that 5 children were below average in weight and height and 13 were overweight. (Spock[4] mentioned obesity as a factor in transient synovitis).

Among other conditions to consider in the differential diagnosis[12–14] are non-accidental injury, growing pains, slipped femoral capital epiphysis, tuberculosis, Duchenne muscular dystrophy, leukaemia, and bone tumours including osteoid osteoma. The possible causes of arthritis are numerous and of particular concern are rheumatoid arthritis[15] and spondyloarthropathy.[16] Rheumatoid arthritis may for months be confined on and off to 1 joint before other joints are affected. Ansell[16] found that the average age of onset of spondylitis is around 10, and that it is 6 times more common in boys. Early symptoms may be pain in the heel, knee, or hip and recurrent transient synovitis of the hip should alert one to the possibility of spondylitis.

The role of infection in transient synovitis of the hip is not clear. Figures for the incidence vary from 20% to 60%.[1 4 17 18] Our finding of β haemolytic streptococcus, Lancefield group C and G, is of interest. Duma[19] in a 2 year study of 140 patients with β haemolytic streptococcal infection found 1 patient with Lancefield group C and 6 with group G. Lancefield group C infections may be asymptomatic[2 19] or cause outbreaks in the newborn nursery,[20] neonatal meningitis,[21] pharyngitis,[22] osteitis, endocarditis, or cellulitis. They may spread from horses[23] or guinea-pigs. Two orthopaedic infections[24] arose from anorectal or nasal carriers. The role of trauma and of allergy is more doubtful. In a review of 342 cases in published reports[4] the incidence of possible trauma was 1·5%. In a study of 105 patients[6] there was no evidence of infection, trauma, or allergy in 46.

With increasing experience I began to realise that several of the special investigations did not contribute to diagnosis or management. The ESR results were of no help and even if the ESR was raised it did not affect treatment. Hardinge[2] and Donaldson[18] reached the same conclusion. Nor did we find a white cell count useful. It may help to eliminate leukaemia or infectious mononucleosis (a rare cause of monoarthritis[25]), but otherwise it is of no assistance.[2] The investigation for C reactive protein was useless—it was absent in all patients in which we did the test. Immunological investigation may provide some help when rheumatoid arthritis is suspected but in the 2 patients in which it was positive, it was negative on follow up.

Radiographic examination of the hip is necessary to eliminate Perthes's disease. It has been suggested[13] that a radiograph of the wrist may help because in 90% of cases of Perthes's disease there is said to be delayed ossification. We have been careful in Sheffield to avoid unnecessary repeat radiographs.

It is particularly difficult to assess the published reports on prognosis because of doubt about the initial diagnosis and because of inadequate follow up which, for a satisfactory conclusion, should take many years. The worst prognosis was that given by Valderrama[17] who followed 23 patients 15 or 30 years after the onset of the disease and claimed that 12 had coxa magna, osteoarthritis, or broadening of the femoral neck and thought that outcome might depend on the age of onset and the severity and duration of symptoms and recurrences. I did not find that severity of recurrence, age, or any other feature were relevant to the likelihood of further attacks. A South African study[8] found that all 50 children had normal hips at follow up and in an Australian study of 101 children,[6] followed for an average of 8·2 years only 2 had abnormal hips. The various figures for the later appearance of Perthes's disease[4 7 13] were difficult to interpret because it is a matter of opinion whether children who later prove to have Perthes's disease should be included in a study of transient synovitis of the hip: I excluded such cases.

In a busy paediatric accident and emergency department such as this with over 27 000 new attendances a year follow up studies are difficult. It is essential that the notes of all attendances of a child in an accident and emergency department are kept together so that the reason for previous attendances is known and relevant investigations are available. If this is not done the fact that the child is having recurrences may be overlooked and there may be a risk of unnecessary irradiation of the pelvis if radiographic examinations are done on each occasion.

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