

## Intra-articular steroids in pauciarticular juvenile chronic arthritis, type 1

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**Abstract.** The use of intra-articular steroids in one or both knees was evaluated in 21 children with type 1 pauciarticular juvenile chronic arthritis (JCA). The beneficial effect of the injection was noted within 3 days with no significant adverse reactions. Remission exceeding 6 months was seen in 70% of the knees and the arthritis remained inactive during the follow up period in 37%. The beneficial effect of the injection did not correlate with sex, age of onset or the presence of antinuclear antibodies or HLA-B27 antigen and there was no relationship with the size of involved joints at onset, the ESR at onset, or the presence of uveitis. Intra-articular corticosteroids in this type of JCA may provide prompt relief of swelling and pain and reduce the need for other forms of therapy. Remission was long lasting in the majority of the children.

**Key words:** Pauciarticular JCA – Intra-articular treatment – Local corticosteroids

### Introduction

Juvenile chronic arthritis (JCA) can be subdivided in three major onset-types (European League against Rheumatism [EULAR]-criteria, 1977): systemic, polyarticular and pauciarticular. On basis of clinical and immunogenetic features pauciarticular disease can be further subdivided into types 1 and 2 [2, 8]. This study was undertaken to evaluate the use of intra-articular corticosteroids in children with pauciarticular disease, type 1.

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*Abbreviations:* ANA = antinuclear antibodies; JCA = juvenile chronic arthritis; NSAIDs = non steroidal antiinflammatory drugs

Children with type 1 pauciarticular disease are frequently seropositive for antinuclear antibodies (ANA) (80%) [7–9] and have a high incidence of uveitis (30%–50%) [8, 9]. In most children large joints are affected, particularly the knee. The treatment consists of a well-balanced programme of rest, exercise and splinting of the affected joint (basic therapy). This programme can be supported by the use of nonsteroidal anti-inflammatory drugs (NSAIDs). Rarely is the arthritis severe enough to require the use of disease modifying drugs. In some patients, however, additional therapy is needed because of persistent pain, muscle wasting or growth disturbance (e.g., leg length discrepancy) [10]. Synovectomy has been the subject of discussion in this situation for a long time, but the procedure is a considerable surgical intervention and prognosis may not be improved [6]. Intra-articular corticosteroid injections have also been considered as a form of treatment of JCA in some centres, but not in others [1, 2, 4, 6]. In order to clarify the potential role of these agents in pauciarticular JCA, type 1 we retrospectively evaluated their effect in a homogenous group of children with this disease.

### Materials and methods

#### *Patients*

Between October 1982 and October 1988 56 children with pauciarticular JCA, type 1, were seen in the paediatric rheumatology clinic. The group consisted of 47 girls and 9 boys.

The mean age at onset was 4.1 years (range 1–13 years) and the mean age at the time of the injection was 7.0 years. ANA, as measured by indirect immunofluorescence using rat liver substrate, were found in 43 (77%) of the patients. Four patients (8%) were positive for the HLA-B27 antigen. Chronic uveitis occurred in 14 children (25%). In 85% of the children, JCA presented with a large joint. A diagnostic biopsy was performed in 25 children. During follow up (6–40 months) 17 children (30%) pursued a monoarticular course, 32 children (57%) had 2–4 active joints, and 7 patients (13%) ran a polyarticular course. None of the patients developed psoriasis during follow-up.

Criteria for the use of intra-articular corticosteroids in knees included the following:

1. Chronic arthritis in one or both knees with pain and morning stiffness, and no response to at least 6 months of conventional treatment (splinting, local application of heat or ice and a proper NSAID-regimen).
2. The presence of adverse effects of NSAIDs (nausea, headache, dizziness) in children with chronic arthritis of one or both knees.
3. Chronic arthritis of one or both knees causing flexion contracture, muscle wasting or growth disturbances (leg length discrepancy).

These criteria were fulfilled by 26 patients. They were on a basic programme before the intra-articular injection was given. Twenty-one (81%) used splints at night and for 1 h during the day. Thirteen (50%) received physiotherapy. NSAIDs were prescribed to 20 patients (77%). Children with monoarticular disease rarely used NSAIDs. Basic therapy differed not significantly in the injected and non-injected group.

Twenty-seven knees of 21 patients were suitable for evaluation in this study. Five patients had to be excluded from evaluation during follow up: two patients because of insufficient duration of follow up and two because of the use of intra-articular corticosteroids in another joint. One girl developed chronic uveitis that required the use of systemic corticosteroids.

*Procedure of corticosteroid injection*

Children under 6 years of age were injected while under short acting inhalation anaesthesia. Older children were injected under sedation when relaxation of the patient during the procedure could not be expected. The procedure took less than 5 min. A 19 gauge needle was introduced at a point 1 cm cranio-lateral to the proximo-lateral patellar corner. As much synovial fluid as possible was removed. Intra-articular injections were given using a mixture of triamcinolon acetonide and lidocaine (1%). Children weighing over 20 kg were injected with 20 mg triamcinolon-acetonide and 1ml lidocaine (1%). Lidocaine was added to minimize the pain which might occur due to chemical synovitis during the first 24-48h after injection. After the injection the knee was passively flexed and extended several times to permit distribution of the drug to all compartments of the joint.

*Evaluation*

Follow up for a minimum of 6 months after injection was required for inclusion in the study. None of the children received a second injection within the subsequent 6 months.

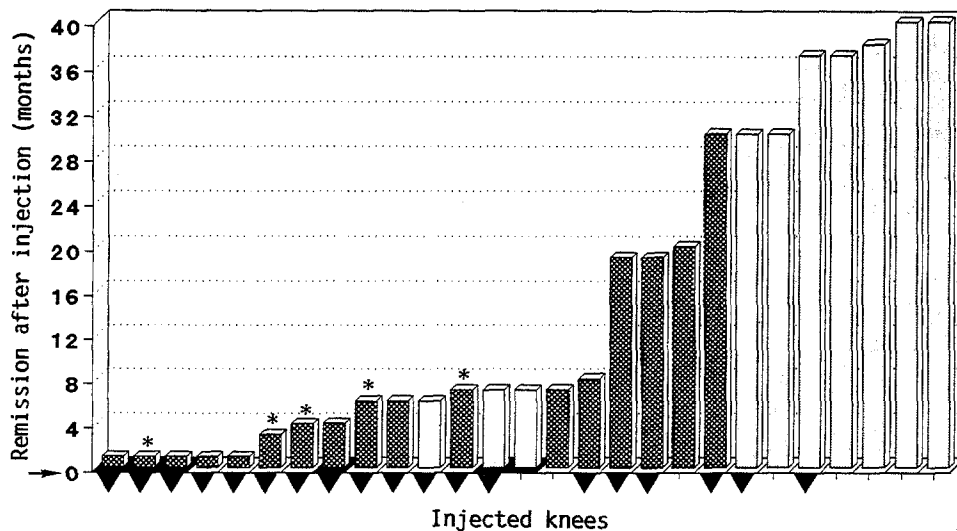
The injection was considered effective when all signs of inflammation vanished – i.e., no soft tissue swelling, no sign of synovial fluid in the joint and no increased temperature on palpation of the skin over the joint.

**Results**

Results of intra-articular corticosteroids are summarized in Fig. 1. Signs of active arthritis resolved in all cases for 1-40 months (mean 15.2 months). Remission exceeding 6 months was seen in 19 knees (70%). Arthritis flared after 1-30 months in 17 knees (63%). Exacerbation within 6 months was confined to children who had already experienced several episodes of arthritis or whose active disease was long-standing (12-20 months). In four children relapse within 6 months was associated with a viral infection, in one child with trauma and in one with vaccination with life attenuated virus. In the other children no provoking event was noted.

The effect of intra-articular therapy was noted within 3 days. Complications of injection consisted of a small atrophic lesion at the injection site in two patients. One girl had a red and painful knee the day following the injection, but it quickly resolved with local ice application. There was no instance of bacterial infection. Regular radiological follow up has revealed no abnormalities in the knees, apart from the usual radiological signs of JCA. After injection wasted muscles improved, joint function normalized and no further increase in leg length discrepancy was seen.

Sex, age at onset, ESR at onset, the presence of ANA or HLA-B27 antigen, the size of joints involved at onset,



**Fig. 1.** Duration of remission (months) after intra-articular corticosteroid injection. [Solid bar], Still in remission; [Dotted bar], end of remission; [Hatched bar], dose too low for weight; [Inverted triangle], longstanding arthritis activity; \*, infection, trauma, vaccination at time of relaps; [Arrow], time of injection

the presence or development of chronic uveitis could not predict the effect of the injection.

## Discussion

A single injection of intra-articular corticosteroid proved effective in suppressing all signs of active arthritis for at least 6 months in 70% of our type 1 pauciarticular JCA patients. More extended benefit from the injection correlated with shorter duration of disease; other clinical factors (sex, age at onset, ESR at onset, the presence of ANA or HLA-B27 antigen, size of joints involved initially and the presence of chronic uveitis) showed no relationship to treatment results.

It was not possible to compare the course of arthritis in the children who had no need for other than basic therapy and a NSAID with the steroid-injected group, since the groups were essentially different. The arthritis in the children treated with intra-articular corticosteroids was more severe and persistent. To further evaluate the use of intra-articular corticosteroids a prospective study including a control group would be necessary.

The application of intra-articular corticosteroids appears to be a safe procedure. In this group of patients there were no complications apart from small areas of localized cutaneous atrophy in two children at the injection site. Other authors have noted the same side-effects [3]. Intraarticular calcifications, as noted by others, were not found [5]. Yearly radiological follow up revealed no abnormalities apart from the usual signs of JCA. The red and painful knee in one patient the day after injection was probably due to crystal synovitis [3].

The results in the patient group reported by Earley et al. (77% improvement) are slightly better than ours [4]. These investigators did not, however, await a possible spontaneous recovery prior to administering intra-articular steroids to their patients. Allen et al. reported similar results (67% good response 6 months after injection) [1]. Both authors studied a heterogeneous group of patients with pauciarticular JCA, type 1 and 2.

In the present study a dosage of 10–20 mg triamcinolone acetonide was administered to each patient. Others report using 20–40 mg of this drug, depending on weight or age (1–3). It is possible, therefore, that some of the cases who benefited only briefly may have received a less than optimal dose of medication.

Others have shown that intra-articular corticosteroid treatment can be repeated after 6 months without adverse reactions [4]. It seems likely, therefore, that many children might be supported in this way throughout the period of disease activity, thus diminishing any need to restrict play activities, as well as reducing requirements for physiotherapy, splinting and NSAIDs.

Pauciarticular JCA, type 1, is a self-limiting disease in most children. It seems reasonable to await a favourable outcome for at least half a year, while a well-balanced programme of rest, exercise and splinting of the affected joints is provided. When further therapy is needed, however, the application of intra-articular corticosteroid is a safe, fast and highly efficacious form of treatment which should not be needlessly delayed.

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