

Factors affecting activity of daily in systemic juvenile idiopathic arthritis

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INTRODUCTION:

Systemic juvenile idiopathic arthritis(sJIA) is an inflammatory disease with high frequency among pediatric rheumatic diseases and patients often suffer from the limitation of ADL¹. The purpose of this study is to investigate the patient factors associated with ADL impairment in patients with sJIA.

METHODS:

89 sJIA cases who had been treated in our hospital from 2000 to 2018 were firstly enrolled in this study and after exclusion of 31 cases, 58 cases who were able to be followed up until age 15 were finally enrolled in this study. We investigated the demographic data such as age at onset, sex, duration of disease, and clinical findings including occurrence of macrophage activation syndrome (MAS), symptoms of fever and pain, and ADL at 15-year-old with Steinbrocker classification.

RESULTS:

There were nearly equal prevalence among girls and boys with a mean age of onset at 6-year-old in a demographic data of our patients. Of 58 patients, 95% had fever at onset with 2 to 3 painful joints involvement, and 50% could achieve drug free remission by the age of 15. At age 15, 17% of sJIA patients had ADL impairment with 10% of severely decreased ADL. The age at onset was significantly related with the ADL impairment at age 15. Joint disorders were prevalent in hip > knee > ankle > wrist. Owing to the treatment, the number of painful joints were significantly reduced from 95 to 18 by the age of 15. The number of joints with residual pain was significantly higher in the patients with ADL impairment. During follow-up, there was a new onset of pain in 12 joints, mainly around hip, knee and foot&toe. In a single regression analysis, demographic data, such as occurrence of MAS, treatment option, and residual symptoms showed age at onset and occurrence of new joint pain; however, age and new onset of joint pain, especially around hip, knee and foot&toe were determined as the factors that significantly affected the ADL impairment at the age of 15(Table1).

DISCUSSION:

Systemic juvenile idiopathic arthritis (sJIA) is an autoinflammatory disease characterized by recurrent systemic inflammation and excessive cytokine production. As many patients require continued treatment into adulthood, transitional care is essential. In this study, we evaluated activities of daily living (ADLs) in sJIA patients during the transition from adolescence to adulthood. Younger age at onset was associated with deterioration of ADLs, whereas baseline systemic inflammation and synovitis showed no clear association. Newly developed joint pain during treatment was significantly linked to decline in ADLs, particularly hip, knee, and foot involvement. Although more than 80% of patients experienced improvement in ADLs by age 15 with effective biologics, approximately 15-17% still showed deterioration. The type of biologic (IL-1 vs. IL-6 inhibitors) and occurrence of macrophage activation syndrome did not significantly influence ADL outcomes. Instead, Larsen grade at onset and the presence of new joint pain were the main predictors of decline². These findings highlight the importance of early recognition and management of joint symptoms, and close collaboration between pediatricians, pediatric orthopedic surgeons, and rheumatologists to preserve ADLs in adulthood.

SIGNIFICANCE:

17% of sJIA patients had ADL impairment at the age of 15 yr-old. The decline in ADL was associated with early-onset and joint pain that appeared during f/u, suggesting the orthopedic intervention can be important in these patients.

Table 1: Factors associated with ADLs

A. Single regression analysis

Variable	P value
Onset age(years)	<0.001
Sex	0.613
biological DMARDS	0.577
MAS	0.665
Larsen grade at age 15	0.003
Fever	0.799
Development of new joint pain	
Hip joint	0.006
Knee joint	0.027
Foot joint	-
Foot&toe	<0.001
Neck	-
Lumber Region	0.201
Shoulder	0.201
Elbow joint	0.105
Hand joint	0.105
Fingers	-

B. Multiple regression analysis

R²=0.636

Variable	B	β	P-value
Constant	1.083	-	0
Onset age	-0.025	-0.147	0.186
Larsen grade at age 15	0.158	0.375	0.006
Development of new foot & toe pain	0.992	0.459	<0.001
Regression formula for angle of postoperative femoral rotation	1.083-0.025×Onset age + 0.158×Larsen grade at age 15 + 0.992×Development of new foot&toe pain		

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