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Epidemiological Profile of Sexual Development in JIA Patients in a Tertiary Care Teaching Hospital in Eastern India

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Abstract

Background: J JIA (Juvenile Idiopathic Arthritis) is a common chronic joint disorder of childhood. In JIA puberty is often delayed. Objective of this study was to evaluate how JIA affect sexual maturity rating of children compared to control group. **Subjects and Methods:** A prospective study was carried out at OPD of tertiary care teaching hospital of Eastern India over 1 year. Patients diagnosed as JIA (Juvenile Idiopathic Arthritis) was included in the study as cases and age sex matched children who came for vaccination or viral fever were included as control. SMR (sexual maturity rating) was done for all. Testicular size was measured in cases of male with orchidometer. **Result:** 75 cases and 75 controls were included in the study. Male female ratio was 5:4. 37 (49.33%) were oligoartcular type, 20 (26.66%) were of RF negative JIA, 6 (8%) belonged to RF positive JIA.11(14.66%) patients were suffering from systemic variety where 1 (1.33%) was suffering from ERA. 17 (22.7%) had achieved SMR stage 2, on the other hand 18 (24 %) of 75 control patients achieved SMR stage 2. There was no significant difference. There was no significant difference in testicular size also. **Conclusion:** In prepubertal stage sexual development is not significantly affected in JIA patients compare to control group.

Key Words: JIA, sexual development.

INTRODUCTION

Juvenile idiopathic arthritis (JIA) is a heterogeneous group of diseases with onset before the age of 16 years and joint inflammation as a main feature.[1] It is a chronic, inflammatory, and progressive disease mediated by cytokines --- interleukin 6 (IL-6), tumor necrosis factor alpha (TNF), and interleukin 1 beta (IL-1ß) --- produced during the inflammatory process and affecting various body systems.[1,2]

Chronic diseases in childhood may delay puberty, especially if they have a prepubertal onset or are so prolonged and severe as to lead to chronic and intense malnutrition.[3,4] In children with chronic arthritic disorders, there is a strong correlation between the activity of the disease and the age of puberty.[5]

The etiology of delayed growth in children with JIA is multifactorial and strongly associated with prolonged inflammatory activity, since pro-inflammatory cytokines, especially IL-6, reduce pituitary growth hormone secretion and act directly on the growth plate of long bones.[5-7] .Chronic diseases in childhood may delay puberty, especially if they have a prepubertal onset or are so prolonged and severe as to lead to chronic and intense malnutrition.[8,9] Persistent inflammatory activity, low weight, and glucocorticoid treatment may result in low IgF-1 levels, which cause alterations in the secretion of growth hormones and gonadotropins, and result in pubertal delay in children with JIA.[10-12]

There is paucity of data regarding sexual development in JIA patients. Aim of our study was to comparison the sexual development of JIA patients in comparison to age, sex and temporally matched controls.

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METHODS

This was a prospective study done at pediatric OPD of a teaching hospital, Eastern India from January 2009 to December 2011. Ethical clearance was taken from the institutional ethics committee. A written consent was taken from the parents of all the participants.

Children between the ages of 2 and 12 years who were diagnosed as JIA as per criteria of International League of Associations for Rheumatology (ILAR) criteria were included in the study.[8] Children with similar age and sex attending the outpatient department at the same time for vaccination or upper respiratory infection were taken as temporally matched controls. Those who had chronic co-morbidities which hamper sexual development like chronic kidney disease, lung or heart disease were excluded from study.

For pubertal staging of children tanner marshall method was applied. For male testicular volume was measured with orchidometer; length of penis, characteristic of pubic hair were also noted. For female patients photograph of different sexual developmental stage were used to compare the sexual developmental stage of study population.

Analysis were done using Statistical version 6 (Tulsa, Oklahoma: StatSoft Inc, 2001) and SPSS version 17 (Illinois, Chicago; SPSS Inc, 2008). Descriptive statistics were used to assess the demographic variables. Nonparametric tests and correlations were used to determine associations with variables and puberty. Cross-tabs were used to compare patients and healthy controls. P values less than 0.05 were considered significant.

RESULTS

We have studied 75 patients JIA and 75 age and sex matched control patients. First we analysed the socio-demographic

profile in the form of age, sex and religion. Then types of JIA analysed.

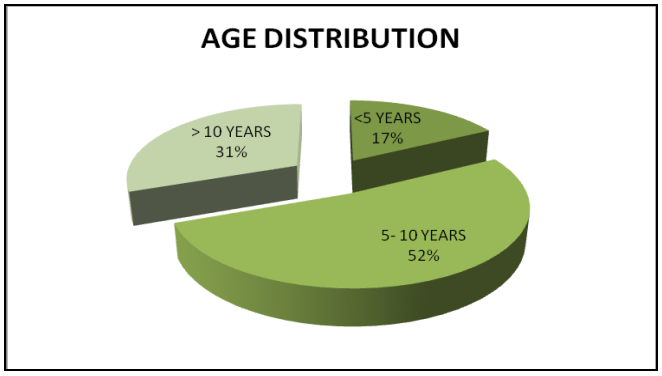

Figure 1: Age distribution of study population

We have included patients up to 12 years of age. Mean age of our study was 8.47 ± 3 years. Our youngest patient was 1 year only and eldest was 12 years of age. 13 patients were below 5 years of age where 39 were in between 5 to 10 years of age and rests of the patients (23) were above 10 years.

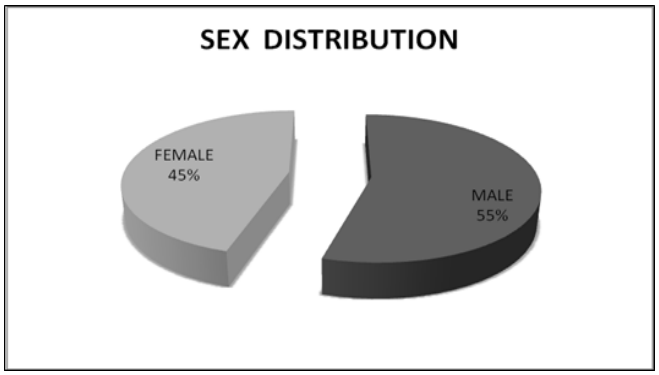

Figure 2: Sex distribution of study population.

Out of 75 patients 41 patients were male and 34 were female. Control group had also same composition.

Out of 75 patients 37 (49.33%) were oligoartcular type, 20 (26.66%) were of RF negative JIA, 6 (8%) belonged to RF positive JIA.11(14.66%) patients were suffering from systemic variety where 1 (1.33%) was suffering from ERA.

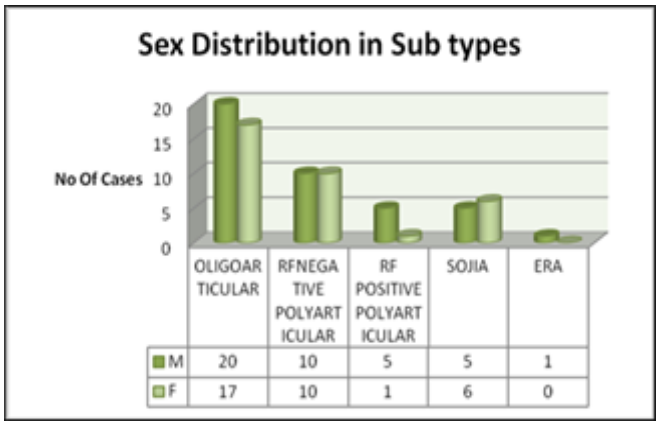

Figure 3: Subtypes of JIA and sex distribution

Out of 75 JIA patients 17 (22.7%) had achieved SMR stage 2, on the other hand 18 (24 %) of 75 control patients achieved SMR stage 2. There was is no significant difference between JIA patients and control group (p=0.84).

Testicular size:

We have compared 41 male JIA patients with control for testicular size and the difference is insignificant P=0.9.

Table 1: Testicular size of JIA patients and controls

Testis size	JIA patients n=41	Control n=41
1cm	13	12
2 cm	21	23
3 cm	7	6

DISCUSSION

In our study up to 10 years all male was in SMR stage 1. At the age of 11 years only 1 patient was in SMR 2 and at the age of 12 years 2 patients attained SMR stage 2. Age matched control group had also same SMR except 3 of the 12 years aged patients were at SMR 2. The difference is insignificant (P>0.05).

In female group prevalence of SMR stage 2 was almost similar with the control group. In both groups 13 patients achieved SMR stage 2. Female group achieved SMR stage 2 earlier than male patients. Age of onset of menarche has wide range 9-14 years. Different studies showed that mean age of menarche in India is above 12 years.[12,13] Our study included patients up to 12 years that is why age of onset of menarche was not included for evaluation of sexual development.

Regarding on 9-12 years 17 % JIA patient had testicular size 3 cm and in control group it was 14 % but the difference is not significant (P>0.05). Aggarwal et al,[14] in their study of JIA patients from Chandigarh showed that the timing of initiation of sexual maturity in boys with different types of JIA remained variably affected. But their study group was consisted of patients of 9-17 years.

This study did not find any significant difference in SMR. Perhaps age of our patients were too small for estimation of SMR and 70 % of our patients were below 10 years of age. El Badri et al found no significant association was demonstrated between the age of puberty onset and the activity of the disease scored using the tender and swollen joint counts, disease activity score (DAS 28) for polyarticular and oligoarticular JIA, the Maastricht AS Enthesitis Score and Bath AS Disease Activity Index (BASDAI) for Enthesitis-related arthritis.[15]

CONCLUSION

Though it is a single catered study and study population below 12 ears, our study shows in early stage of sexual development JIA does not have significant negative impact.

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