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FRI0545

HEMODYNAMIC MEASUREMENTS AND ARTERIAL STIFFNESS IN PATIENTS WITH JUVENILE IDIOPATHIC ARTHRITIS COMPARED TO CHILDREN WITHOUT JUVENILE IDIOPATHIC ARTHRITIS

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Background: Juvenile Idiopathic Arthritis (JIA) can cause long-term cardiovascular complications. There are non-invasive, validated, easy to perform methods for cardiovascular testing, such as: carotid intimal-media thickness (cIMT), and measurement of arterial rigidity through carotid distensibility, carotid-femoral pulse wave velocity (cfPWV) and the augmentation index (AIx).

Objectives: To compare the main hemodynamics measurements (cIMT, carotid distensibility, cfPWV and AIx) between JIA and non-JIA subjects.

Methods: Analytical cross-sectional study in subjects 5 to 16 years of age. Two groups: patients with JIA according to the ILAR classification without any other condition vs healthy children. Measurements: somatometry, laboratory (glucose, creatinine, lipid profile), disease activity index (JADAS-27) and hemodynamic variables (cIMT, carotid distensibility, cfPWV and AIx).

Results: 63 JIA subjects and 50 healthy controls were included, mean age 11.5 ± 2.8 vs 10.7 ± 3.2 years ($p = 0.17$) and 70% vs 54% females, respectively. Both groups were also similar ($p > 0.05$) for nutritional state, sedentary lifestyle, smoking habits and family history of cardiovascular risk. Table 1 show lipid profile of both groups. Subtypes of JIA were: RF positive polyarthritis (29%), RF negative polyarthritis (29%), oligoarthritis (19%), enthesitis-related arthritis (14%) and systemic arthritis (9%). Mean time of disease evolution was 4 ± 3 años. There were no significant differences between groups in the main hemodynamic parameters (table 2). When comparing inactive vs active disease and active disease vs controls there were no differences either, we found a discrete trend to less carotid distensibility and higher cfPWV in patients with active disease compared to controls [0.63 ± 0.17 mm vs 0.66 ± 0.15 mm ($p = 0.94$) and 6.12 ± 2.88 m/s vs 5.42 ± 0.75 m/s ($p = 0.33$), respectively]. 59% of subjects with JIA were inactive according to JADAS-27. When considering time of disease evolution, children with 0-4 years vs children with >4 years and children with >4 years vs controls, we found differences in cIMT [0.41 ± 0.62 mm vs 0.44 ± 0.50 mm ($p = 0.02$) and 0.44 ± 0.50 mm vs 0.40 ± 0.70 mm ($p = 0.01$), respectively].

Finally, cfPWV was higher in patients with 0-4 years than in patients with >4 years of evolution ($p = 0.01$).

TABLE 1. LIPID PROFILE

LIPID	JIA	CONTROLS	<i>p</i> [†]
Triglycerides	94 ± 56	85 ± 36	0.22
Total cholesterol	141 ± 27	152 ± 26	0.06
HDL cholesterol	45 ± 12	47 ± 10	0.36
LDL cholesterol	77 ± 21	87 ± 22	0.01
VLDL cholesterol	18 ± 11	17 ± 7	0.52

[†]Mann-Whitney U test.

TABLE 2. HEMODYNAMIC MEASUREMENTS

MEASUREMENT	JIA	CONTROLS	<i>p</i> [†]
cIMT (mm)	0.42 ± 0.59	0.40 ± 0.70	0.11
Carotid distensibility (mm)	0.64 ± 0.16	0.66 ± 0.15	0.78
cfPWV (m/s)	5.77 ± 2	5.42 ± 0.75	0.66
AIx (%)	69 ± 15	69 ± 12	0.64

[†]Mann-Whitney U test.

Conclusion: We found a tendency to increased cardiovascular risk when the disease has more than 4 years of evolution, specially in patients with persistent active disease. Traditional and non-traditional cardiovascular risk factors add up in this population. We need longterm follow-up studies.

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TRAJECTORIES OF DISEASE ACTIVITY OVER THE FIRST THREE YEARS FOLLOWING JUVENILE IDIOPATHIC ARTHRITIS DIAGNOSIS

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Background: The advent of biological therapies and early aggressive treatment strategies have drastically changed prognoses for children and young people (CYP) with juvenile idiopathic arthritis (JIA). Clinical trials and observational research have demonstrated improvements in disease for the majority, but not all, CYP over time. It is not currently known what the patterns of disease activity are in CYP with JIA and how these cluster over time.

Objectives: To explore latent patterns of clinical juvenile arthritis disease activity scores (cJADAS) following a diagnosis of JIA.

Methods: CYP with JIA were selected if enrolled in the Childhood Arthritis Prospective Study (CAPS), a UK multicentre inception cohort, before January 2015. cJADAS10 scores were calculated based on components (active joint count up to 10, physician global, patient/parent global) collected at diagnosis, six months, one year and then annually to three years. CYP were excluded if no cJADAS10 scores were available within this time frame.

Group-based trajectory models were constructed to model latent groups of cJADAS10 scores. Linear, quadratic and cubic polynomials were tested, with one to six trajectories tested within each polynomial group. An optimal model within each polynomial group was selected using Bayesian Information Criteria. The final model was then selected from this shortlist based on model parsimony and clinical plausibility.

Results: Of 1183 CYP selected, the majority were female (65%) and of white ethnicity (90%) with oligoarticular JIA the most common JIA category (45%).

The optimal model identified five cJADAS10 quadratic trajectories (Figure 1): Low-low (59%, initial cJADAS10 median: 6.1), moderate-low (16%, initial cJADAS10 median: 11.5) and three groups with high disease activity at initial presentation (initial median cJADAS10: 17.7 to 19.1). A high-low group experienced the greatest improvement (15%, median improvement 17.2 (IQR 13.7 to 20.1)), and a high-moderate group lesser improvement (5%, median improvement 7.3 (IQR 0.8 to 9.0)). A final high-low-high group experienced improvement to one year followed by disease relapse (5%).

Conclusion: Disease activity in CYP with JIA does not improve in a uniform manner following initial presentation to paediatric rheumatology. Five latent trajectory groups have been identified, with three of these displaying different patterns following initial high disease activity at diagnosis. Identifying distinguishing characteristics for each group may aid the stratification of different treatment strategies to facilitate personalised medicine in JIA.

Figure 1. Latent trajectories of cJADAS10 scores in young people with JIA over the first three years following diagnosis

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DEVELOPMENT AND INITIAL VALIDATION OF THE SYSTEMIC JADAS, A NEW COMPOSITE DISEASE ACTIVITY SCORE FOR SYSTEMIC JUVENILE IDIOPATHIC ARTHRITIS

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Background: Juvenile Arthritis Disease Activity Score (JADAS) has gained increasing popularity for the measurement of the level of disease activity

in patients with juvenile idiopathic arthritis (JIA). However, so far the JADAS has been validated only in children with the non-systemic categories of JIA.

Objectives: To develop and validate the systemic JADAS (sJADAS), a new version of the JADAS specific to systemic JIA (sJIA).

Methods: The sJADAS is made up by adding a fifth item, named Systemic Manifestation Score (SMS), to the four items included in the original tool (physician global assessment of disease activity, parent/patient global assessment of well-being, active joint count and erythrocyte sedimentation rate). The SMS ranges from 0 to 10 and is aimed to quantify the activity of systemic features. The sJADAS score ranges from 0 to 50. The validation sample included patients with definite and possible/probable sJIA with active systemic manifestations, which should comprise fever, who were assessed at baseline and then at a subsequent visit, 2 weeks to 3 months after initial evaluation. Validation procedures included assessment of concurrent, construct and discriminant validity, internal consistency and responsiveness to clinical change.

Results: A total of 161 patients, 86.7% (n=137) with definite sJIA and 13.3% (n=21) with possible/probable sJIA, assessed at disease onset (n=90; 56.6%) or at time of a disease flare (n=69; 43.4%), were enrolled at 57 centers in 10 countries from February 2017 to December 2018. Median age at disease onset was 5.0 years (interquartile range, IQR 2.8 - 8) and median age at study entry was 6.9 years (IQR 3.8–10.8). Median disease duration from onset to study entry was 0.2 years (IQR 0.1–1.9). The median sJADAS at baseline visit was 28.2 (IQR 22.8–35.0). The sJADAS correlated strongly with JADAS10 ($r_s=0.98$) and clinical JADAS10 (cJADAS10) ($r_s=0.91$); moderately with functional ability scales (JAFS and CHAQ) ($r_s=0.69$; $r_s=0.62$) and total score ($r_s=0.57$) and physical ($r_s=0.60$) and psychosocial ($r_s=0.40$) subscale scores of the health-related quality of life tool (PRQL) and with pain VAS ($r_s=0.57$); and mildly with the CRP ($r_s=0.42$). The sJADAS discriminated well between patients with or without morning stiffness ($p<0.0001$), with different levels of disease activity defined subjectively by the physician ($p<0.0001$) and with different degrees of pain ($p<0.0001$). The internal consistency was good (Cronbach's $\alpha=0.64$) and comparable to that of JADAS10 (Cronbach's $\alpha=0.59$), and cJADAS10 (Cronbach's $\alpha=0.63$). Responsiveness to change, measured on all patients (SRM=2.23) and on patients classified as improved at second visit (SRM=2.41), was strong and superior to that of JADAS10 (SRM=1.92 and 2.14, respectively).

Conclusion: The sJADAS was found to be a valid instrument for the assessment of disease activity in sJIA. This composite score is feasible and easily applicable in standard clinical practice, which should result in its widespread acceptance and use. The strong responsiveness to clinical change over time indicates that the sJADAS is suitable to assess therapeutic response in sJIA clinical trials.

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