**Table 3 Analytical Observational Studies and Uncontrolled Experimental Studies**

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| **ARTICLES AND AUTHORS** | **YEAR AND DESIGN OF STUDY** | **SUBJECTS** | **METHODS** | **OUTCOME** | **RESULTS** | **CONCLUSIONS** |
| (31) Effect of acute exercise on circulating endothelial and progenitor cells in children and adolescents with juvenile idiopathic arthritis and healthy controls: a pilot study.  Obeid J, Nguyen T, Cellucci T | 2015  Case-control | Seven youth with JIA and six controls. Inclusion criteria: all patients were 8 to 17 years of age, and were diagnosed with JIA in accordance with the International League of Associations for Rheumatology criteria. Exclusion criteria: Patients were only excluded from participation if they did not have a confirmed JIA diagnosis, were diagnosed with any other medical condition, or had contraindications for exercise, including joint pain or swelling that would prevent completion of the exercise tests. | Participants performed either moderate intensity, continuous exercise (The MICE protocol consisted of 2 × 30-min bouts of cycling at 50 % of Ẇpeak, with a 6-min rest between bouts) or high intensity, intermittent exercise (The HIIE protocol consisted of 6 sets of 4 × 15-sec bouts of cycling at 100 % of Ẇpeak for a total of 6-min of exercise; participants were given a 1-min rest between bouts, and 6-min rest between sets) on separate days. | Aerobic fitness was assessed using the McMaster All Out Continuous Progressive test. Blood samples were collected at the beginning (REST), mid-point (MID) and end of exercise (POST) for determination of EPCs (CD31 + CD34bright CD45dimCD133+) and CECs (CD31 brightCD34+CD45−CD133−) by flow cytometry. | V O2peak, a measure of aerobic fitness, tended to be lower in JIA vs. controls, but Wpeak was similar. No differences were observed in resting levels of EPCs or CECs in youth with JIA compared with healthy controls. | Youth with JIA demonstrated a blunted EPC response to MICE when compared with controls. High intensity intermittent exercise had no effect on either CECs or EPCs in JIA and control group. |
| (32)Regular aerobic training combined with range of motion exercises in juvenile idiopathic arthritis.  Doğru Apti M, Kasapçopur Ö | 2014  Case-control | Thirty patients with JIA and 20 healthy age-matched controls were included. Inclusion criteria: All patients were 8 to 16 years of age, and were diagnosed with JIA in accordance with the International League of Associations for Rheumatology criteria. | All patients performed aerobic walking (4 days a week for 8 weeks) and active and passive ROM exercises of involved joints. | CHA questionnaire  CH questionnaire  ROM (goniometer)  Aerobic capacity (VO2peak through  Treadmill test). | Eight-week combined exercise program significantly improved exercise parameters of JIA patients. | The authors suggest that regular aerobic exercise combined with ROM exercises may be an important part of treatment in patients with JIA. |
| (33) Safety and feasibility of a home-based six week resistance training program in juvenile idiopathic arthritis  Van Oort C, Tupper SM, Rosenberg AM | 2013  Uncontrolled experimental studies | 7youth with JIA, (four participants had active disease and three inactive disease). | The program consisted of a five minute warm up, 25 minutes of resistance training and eight minute cool down.  Frequency: -3days/wk at home  -6 wk period.  Duration:  40 minutes | -Pain;  Inflammation and muscle size;  -muscle strength;  -functional ability.  Instruments: VAS and electronic diary, ultrasound, dynamometer, CHA questionnaire. | No adverse events were reported and pain did not increase. Secondary measures revealed a significant increase in vastus lateralis thickness. | A home-based resistance training program is both safe and feasible in children with JIA. |