Research Abstract

I. Title: Factors Influencing Biological Markers of Cardiovascular Risk in Children with Juvenile Arthritis

II. Investigators (including co-investigators) and their Institutional Affiliations

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III. Hypothesis, Research Questions, or Goals of the Project

The goal of this project is to collect pilot data from a retrospective chart review to investigate factors influencing the development of hyperlipidemia in children with Juvenile Arthritis (JA). To achieve this aim the project will evaluate patients who had medical visits at the ‘Specially for Children Rheumatology Clinic with any doctor between the dates of 05/01/2012 and 08/31/2014. Because the development of cardiovascular disease is a prolonged process taking decades, this project will review patient factors and biomarkers as surrogate markers for future cardiovascular disease. Specifically, lipid levels, BMI, and inflammatory markers will be evaluated as biomarkers of cardiovascular risk for the purpose of this study based on existing evidence (Coulson, et al., 2013; Hayes & Patwardhan, 2014). Data collected will be used to design future prospective interventional research studies for this population, with the primary purpose of improving care and long-term cardiovascular outcomes for children with JA.

The research design is guided by the following question:

In children with JA, what patient factors are associated with increasing known biomarkers for cardiovascular disease?

IV. Background and Significance:

This project represents an initial step in a research agenda seeking to understand the role of nutrition in the management of Juvenile Arthritis (JA). Specifically, this study will explore the factors that influence biological markers of cardiovascular risk in children with JA. Such research is a critical first step toward understanding how external factors such as socioeconomic status and eating behaviors influence internal physiology, and then developing appropriate interventions.

Obesity causes the body to be in a state of chronic inflammation, which is implicated as a key pathophysiologic process in the development of cardiovascular disease (Barbaresko, Koch, Schulze, & Nothlings, 2013). An understudied subset of obese children is those with JA, which refers to a collection of inflammatory joint diseases with symptom onset prior to age 16 years (CDC, 2013). JA is the most common autoimmune disease in children, and pediatric rheumatologic disease accounts for 827,000 doctor visits each year, including 83,000 emergency department visits (Sacks, Helmick, Luo, Ilowite, & Bowyer, 2007). Obesity is present in nearly one-fifth of children with JA and results from a variety of factors: chronic pain, sedentary lifestyle, chronic use of immunosuppressant medications, and the disease process (Pelajo, Lopez-Benitez, & Miller, 2012). All contribute to chronic physiologic stress that negatively affects appetite, food choices, and fat storage (Barbaresko et al., 2013). Children with JA have an increased incidence of traditional cardiovascular risk factors in addition to the risk factors associated with chronic inflammation (AHRQ, 2011; Coulson, Ng, Goff, & Foster, 2013).

It is clear that maintaining a healthy weight is integral to JA patients’ quality of life and disease management; however, dietary recommendations are inconsistently provided to patients in clinics. Further, since a large proportion of patients are white, little research has been done on minority populations living with JA (Ringold, Beukelman, Nigrovic, & Kimura, 2013). Thus, the few existing health and nutrition resources available to patients are designed with a white audience in mind (Satia, 2009). The purpose of this project will be to illuminate the factors that contribute to biological markers of cardiovascular risk among this vulnerable population in order to design an appropriate prospective study. Future research will investigate the most effective method of communicating dietary information to a diverse, understudied population in order to influence self-management of chronic disease.

V. Research Method, Design, and Proposed Statistical Analysis:
FACTORS INFLUENCING CVD RISK IN JUVENILE ARTHRITIS

A total of 480 records exist for patients with a diagnosis of arthritis were seen at the clinic between 05/01/2012 and 08/31/2014. Data will be collected from a retrospective chart review of these records using the Athena software and a data collection form. Data analysis methods include descriptive statistics, t-tests, chi square, and regression.

VI. Human Subject Interactions

A. Sources of potential participants

Data will be collected from 480 patient medical records. Patients are between the ages of 2 and 24 years.

Inclusion criteria:
- Diagnosis of an arthritic condition prior to age 16
- Seen in the rheumatology clinic by any doctor between the dates of 05/01/2012 and 08/31/2014.

Exclusion criteria:
- Diagnosis of Down’s Syndrome (Trisomy 21)

B. Procedures for the recruitment of the participants.

Data will be collected via retrospective chart review through Athena and eCW software programs. Participants will not be actively recruited for this study.

C. Procedure for obtaining informed consent.

Because this study will be limited to an analytical review of existing data and involves minimal risk to the subjects, we request a waiver of informed consent. Participants will not be contacted for any reason and will not be asked to perform any additional actions.

D. Research Protocol.

Data will be collected via the Athena and eCW systems using a data collection sheet. Please see the data collection sheet included with the proposal for specific data that will be collected. Types of data included on the data collection sheet include:

- Demographics
- Labs
- Dietary data
- Significant medical and surgical history
- Medication use
- Child and Parent’s preferred language, language spoken in the home most frequently
- Pediatric ACR (30-50-70-90-Remission)
- Occupational Therapy, Physical Therapy, and physical activity

Direct contact with patients will not be required; study data will be obtained solely from retrospective review of medical records or other patient care-databases. Patients will not be contacted for any additional information during the course of these investigations.
E. **Timeline.**

December 2014: Submission to Seton IRB
January 2015: Submit to UT IRB (pending approval from Seton IRB)
February 2015 (or as soon as both Seton IRB and UT IRB approval are received): Begin data collection and analysis
April 2015: Presentation of preliminary findings

VII. **Results and Findings**

A. **Results**

i. This research is currently in process and under review by the Seton IRB. By April 2015, it is expected that preliminary results will be available for presentation.

B. **Findings**

i. This project is innovative in that it investigates a variety of sociocultural and biological factors influencing cardiovascular risk in a diverse and understudied population of children with JA. Since a majority of children with JA are white, we need data to understand how the needs of other ethnic groups are unique.

ii. Since this is a retrospective chart review, some limitations of the findings are possible. First, existing records may be incomplete and some data points may be missing from the charts. Second, since this is a single site study, it may be necessary to collect records from other sites to ensure the generalizability of the results. However, it is important to begin to build evidence about this understudied population to improve care.

**References**


Hayes, T. & Patwardhan, A. (2014). A95: The risk of dyslipidemia in pediatric arthritis patients is similar to that of adult patients with arthritis. *Arthritis & Rheumatology, 66*(S3), S130. doi: 10.1002/art.38512


