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BACKGROUND AND OBJECTIVES: Bronchial asthma is a condition characterized by widespread bronchial obstruction due to muscular spasm producing expiratory wheezing with prolongation of expiration. In this multifactorial condition, a thick, white mucus is produced by the respiratory epithelium of the bronchi leading to obstruction of the airways and considerable difficulty in breathing. While individuals may be exposed to the same or very similar environments, the question of why some become asthmatics while others do not is a taxing one.

We hypothesise that chronic physical and/or psychological stress is in part the answer. Stress is associated with an increase in circulating cortisol which among other things causes a reduction in immunity and increases smooth muscle contractibility. Reduction in immunoglobulin A (IgA) associated with the respiratory epithelial lining makes an individual more susceptible to spasm of the respiratory smooth muscle due to pathogenic invasion. This is compounded by the muscles increased sensitivity to contraction due to inhibition of catacholamine uptake.

The broad aims of this FCER funded study is to determine whether stress is a factor in the pathophysiology of asthma and to determine if chiropractic management of asthmatics can alleviate stress induced asthma. More specifically for this meeting, our study aims to determine whether chiropractic treatment has beneficial effects on the endocrine system through measurement of salivary cortisol and on the immune system via salivary IgA determination.

METHODS: Both asthmatic and non-asthmatic patients are sourced through advertisements and press releases in state and local newspapers, bulletins of asthma interest groups, schools, community health groups and radio and television, in the greater Sydney area. Interested subjects phone a hotline and details regarding their brief medical history and treatment regimes are requested. Subjects are sent correspondence on two separate occasions detailing the trial aims and objectives and the requirements of each patient and consent forms. Subjects are further requested to attend an information seminar before they are required to take full spinal x-rays. Subjects are selected for the trial based on their medical history, age, procedural understanding, wellness questionnaire and on the outcomes of their x-rays. Selected subjects are randomly assigned to 4 groups consisting of:

A) chiropractic treatment at centres (3 times per week),
B) no treatment at centres,
C) no treatment at home and
D) non asthmatics no treatment at home.

Patients undergo a 14 week program consisting of a 2 week pre treatment, 6 week treatment and 6 weeks post treatment regime. Chiropractic treatment is carried out across 23 centres around Sydney. All clinicians are University educated and registered and all attend at least one of our

research orientation seminars to ensure research standards, protocols and procedures are strictly adhered to. The accepted techniques include high velocity low amplitude spinal adjustments, diversified, passive wedge, and activator methods. All patients are administered an asthma questionnaire, the SF-36 wellness questionnaire, and the depression, anxiety stress scales (DASS) at the commencement, midway through and completion of the 14 weeks.

All patients provide saliva samples at 8am and 8pm three times a week on Tuesdays, Thursdays and Sundays. Saliva samples are assayed for cortisol, IgA, osmolality, albumin and creatinine. While an individuals stress level and immune state is measured through cortisol and IgA levels, osmolality, albumin and creatinine is used to check the quality of saliva samples provided to ensure that changes in the former are specific to stress and immunity. A total of 400 patients will be involved in the trial providing over 35,000 samples and over 176,000 assays will be performed. This is the largest, most comprehensive trial of this type attempted.

RESULTS: We report here the cortisol and IgA patterns that are emerging from the data collected and analysed thus far. We are at this stage reluctant to commence a full comprehensive statistical analysis of all the data at hand as it is not "best practice" to do so. The results we have to date suggest a decrease in salivary cortisol over the 14 week period for patients receiving chiropractic care compared to those who are not. However we do note an initial increase in cortisol at the commencement of treatment followed by a decrease over the 6 weeks post treatment period. Mean morning salivary cortisol for the A group at the commencement of the trial is 6.2 mg/dL which increases to 7.7 mg/dL in the first 2-3 weeks of treatment. Mean salivary cortisol however decreases to its lowest levels over the 14 week trial period to 4.6 mg/dL in the last two weeks of the trial. In contrast, mean salivary cortisol values remained unchanged over the 14 week trial period for group B and group C. While group B does not show an overall decrease in cortisol, we do observe a slight increase 2-3 weeks into clinic visit for some patients.

In concert with this we also note an increase in salivary IgA levels for both groups A and B but not in group C. This is in line with our hypothesis outlined above. Perhaps the most striking feature of our IgA data to date is that IgA levels in asthmatics are very erratic throughout the period of the trial suggesting repeated infections or other stressors on the respiratory system. This erratic nature of IgA by in large disappears after chiropractic treatment (group A), whereas it is maintained in groups B and C.

CONCLUSIONS: This FCER funded study aims to determine the effects of chiropractic treatment of the endocrine and immune system of asthmatic patients. We have determined from the data thus far that direct chiropractic treatment (6 weeks) reduces salivary cortisol levels over the 14 week period of this trial. We do however note an initial increase associated with the first 2-3 weeks of treatment. This could either be due to anxiety associated with visiting a clinic or due to the physical nature of the chiropractic treatment. That some patients showed a slight increase 2-3 weeks into clinic visit suggest the former. However full analysis of the data at the conclusion of the trial with respect to individual patient changes versus treatment regime received will be required to finalise this question. There is no indication at this stage that the reduction in cortisol after chiropractic treatment is due to the well characterised placebo effect as both group B and group C cortisol values remained unchanged from the start to the end of the

trial.

In support of our hypothesis outlined above we show an increase in salivary IgA levels for group A patients. We expect this to be partly responsible for the decrease in the severity and number of asthmatic attacks experienced by these patients. The most striking feature was the decrease in the erratic nature of IgA levels for group A patients. We attribute this to an increase in basal IgA levels associated with decreased cortisol and hence a better ability of patients to ward off potential pathogenic invasion (or the like) which ultimately shows the increasing / decreasing erratic IgA patterns we observe.

Whether chiropractic treatment effects both the endocrine and immune systems independently or one system through the other requires further analysis of our biochemical data and questionnaire data for individual patients. Full analysis of our data, which we plan at the conclusion of this trial, will also have the benefit of answering a large number of questions related to the efficacy of chiropractic treatment regimes. It is the comprehensive nature of this trial that will make this possible. Our results strongly suggest somatovisceral mechanisms are involved in chiropractic treatment.