Evidence for the presence of inflammatory activity in patients with Complex Regional Pain Syndrome (CRPS): A systematic review and meta-analysis.

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research into the role of the brain & mind in chronic pain
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1. Introduction

Inflammation is thought to play a role in CRPS[1]. A precise description of the inflammatory response in CRPS may assist in the identification of potential targets for therapy.

2. Aims

(a) To determine whether, in adults, CRPS is associated with a specific inflammatory profile;

(b) To determine wether the inflammatory profile is dependent on the duration of the condition.

3. Materials and Methods

We adhered to the PRISMA statement[2] using standard systematic review and meta-analytic methods. Studies were included if they were published or in-press/accepted by 30 January 2012; measured biomarkers of inflammation in human CRPS subjects and controls; obtained samples from blood, cerebrospinal fluid (CSF), or fluid from experimentally induced blisters. Quality was assessed using an adapted STROBE statement[3].

4. Results

Studies: 2420 unique records were screened; 22 studies were included in the qualitative synthesis; 15 studies were included in the meta-analysis. Most studies did not meet 3 or more of our quality criteria.

Meta-analysis: Effect estimates, calculated from the absolute concentrations of inflammatory markers in individual studies, are represented in forest plots as standardized mean differences (SMD; Hedges' adjusted g) and 95% confidence intervals (C.I.). Open boxes and horizontal bars indicate, respectively, the weighted effect size and 95% C.I. in an individual study. The filled diamonds indicate the effect size and its 95% C.I. as obtained from the meta-analysis of pooled studies. Point estimates to the right of the vertical line indicate that the respective factor is present in CRPS cases versus controls.

Figure 1: Acute CRPS; Blood

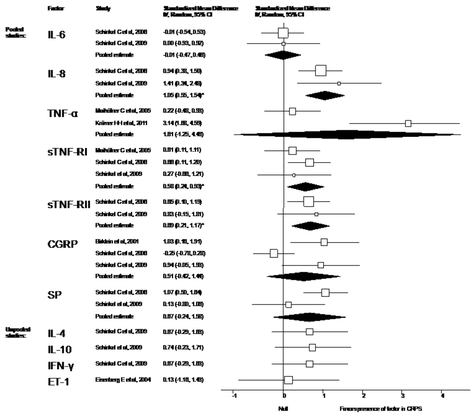


Figure 2: Chronic CRPS; Blood

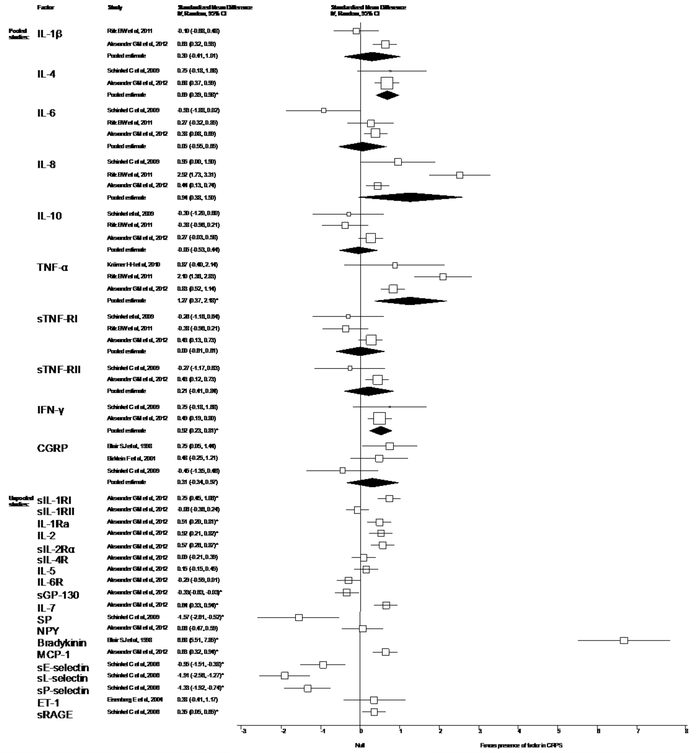


Figure 3: Chronic CRPS; CSF

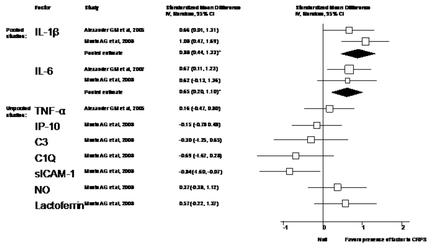
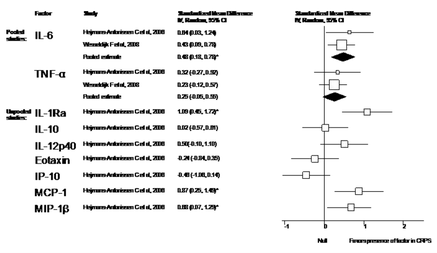


Figure 4: Chronic CRPS; Blister fluid



5. Conclusions

We found that (a) CRPS was associated with a predominantly pro-inflammatory state; and (b) inflammatory profiles differed between acute CRPS and chronic CRPS.

Acute CRPS was associated with increased levels of pro-inflammatory factors without an attendant anti-inflammatory response. Chronic CRPS was potentially associated with the presence of Th17 activity but there is currently inadequate evidence to definitively support this.

Citations:

1. Marinus J, Moseley GL, Birklein F, et al. Clinical features and pathophysiology of complex regional pain syndrome. Lancet Neurol 2011;10:637-648.
2. Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Journal of clinical epidemiology 2009;62:1006-1012.
3. Gallo V, Egger M, McCormack V, et al. STrengthening the Reporting of OBservational studies in Epidemiology--Molecular Epidemiology STROBE-ME: an extension of the STROBE statement. Journal of clinical epidemiology 2011;64:1350-1363.