

## RCC Research Bulletin

### 23 March 2020: Spinal manipulation and the immune system

The question of whether spinal manipulation has an effect on the immune system has been the subject of a small number of studies identified by three reviews across the subject [1,2,3].

#### Studies investigating the effects of spinal manipulation on immunoregulatory cells and molecules

Four primary studies have investigated the effects, in healthy individuals, of spinal manipulation, compared with sham or comparison interventions, on cells and secreted molecules with roles in immunoregulatory function (Substance P, regulatory T cells, interleukin-2, interleukin-2 regulated antibodies and Tumour Necrosis Factor (TNF)). These cellular/molecular responses were measured in isolated *in vitro* systems [4-7]. The studies reported some effects, however these were contradictory, and it is not known what clinical relevance, if any, these effects have (see explanation below).

A further RCT investigated responses in HIV positive patients to upper cervical adjustments. This study had ten patients, equally divided between treatment and the control groups. No significant difference in blood CD4 cell counts were observed in the treatment group compared to the control group [8].

The difficulty in interpreting reported *in vitro* cellular/molecular responses are clearly demonstrated by the findings for altered TNF in two studies. One study (with no control group) found *increased* TNF levels after SMT [9], however another reported *decreased* TNF levels measured at a different time point [5].

Immune cellular/molecular responses are highly complex, differing over time and having different and sometimes opposing effects in physiological (healthy function) versus pathological states [10]. In the case of TNF, increased levels can have putatively beneficial effects on the activation of regulatory T cells. However, its effects can also be detrimental; TNF is a pro-inflammatory cytokine that causes apoptosis in tumour/cancer cells [10]. This clearly illustrates the fact that *in vitro* findings cannot be extrapolated to clinical effects.

There have been no reported systematic evaluations of the quality of any of the studies described above.

#### Clinical trials of pro-immune effects of spinal manipulation

There is no available evidence from clinical trials investigating effectiveness of spinal manipulation on improving patients' immunity to contracting infectious disease.

Two studies that have been widely quoted as providing evidence of such effects either cannot be found [11] or constituted narrative accounts of historic events over 100 years ago that cannot be corroborated [12]. Thus, there is no available scientific evidence that would permit valid claims to be made for spinal manipulation conferring or enhancing immunity.

#### Key point summary

- There are no clinical trials of the effectiveness of SMT on enhancing immunity to infectious diseases

- 3 out of 4 studies report various cellular/molecular responses to SMT *in vitro*, however these are contradictory and offer no evidence of an overall likely pro-immune, clinically-relevant effect in patients
- There has been no systematic appraisal of the quality of the studies in this field
- There is no evidence that would reach the threshold of the Advertising Standard Agency (ASA) for enabling claims to be made for effectiveness of spinal manipulation on immunity

## References

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