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Spondyloarthritis – clinical aspects (other than treatment)

THU0227

SPINAL FRACTURE RISK IN ANKYLOSING SPONDYLITIS IN WESTERN AUSTRALIA

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Background: In Ankylosing Spondylitis (AS) chronic spinal inflammation contributes to spinal osteoporosis and rigidity. Large scale studies on vertebral fractures in AS patients are scarce with rates reported between 0.4% and 32%¹⁻³. While biological therapy for AS has been associated with better clinical outcomes, the long-term effect on spinal osteoporosis remains uncertain.

Objectives: To longitudinally investigate population wide spinal fracture rates in AS patients and compare the risk, disease burden and survival rates between AS and age/gender matched controls.

Methods: A case-control study sourced from linked health data on Emergency Department visits, Hospital Morbidity and Mortality Registry data for the period 1980–2015. Vertebral fractures prevalence (ICD-9: 733.13, 805X and 806X, ICD-10: M48.4X, M48.5X, M80.0X, S12.X, S22.X, S32.X), burden of disease and mortality were compared between AS patients (ICD-9: 720.0, ICD-10: M45X or M08.1) with up to 5 controls matched for age, gender, Indigenous status and event date.

Results: We included 1285 AS patients (70% males) with mean age of 42.87 ± 18.4 years at first event, followed for a median of 24 years.^{19, 30} Spinal fractures were more frequent in AS patients than controls (52, 2.8% vs. 39, 0.6%, $p < 0.0001$, respectively), and among the AS patients, 27 (2%) had a single and 9 (0.7%) had multiple fractures. Thoracic fractures were most common (17, 33%), followed by cervical (10, 19%), lumbar (9, 17%), sacral and coccyx (4, 8%) and one unspecified vertebral fracture.

Overall AS participants were at greater risk (OR: 4.78; 2.9, 7.7 CI) for spinal fractures than controls. The risk remained relatively consistent; ranging from OR: 4.72 (2.75, 8.08 CI) during 1980–89 to OR: 4.90 (1.68, 14.25 CI) throughout 1990–99. However, during 2000–2013, all 4 newly AS diagnosed patients experienced a total of 7 fractures compared to none in controls. Greater age at first hospital contact among AS patients increased the risk in having a vertebral fracture (OR: 1.035; 1.01, 1.05 CI), while presence of psoriasis and inflammatory bowel disease were not risk factors.

Survival rates following vertebral fractures at end of follow-up (35 years) were significantly lower for AS patients, (92%, vs. 98.5%, $p < 0.0001$) compared to controls.

Conclusions: The absolute risk for spinal fractures in AS patients is 2.8%, which is nearly 5 times the risk in controls. The risk has not improved in the era of TNFi therapy and the associated increased mortality indicates that spinal fractures remain a severe complication of AS.

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THU0229

ABSOLUTE REDUCTION OF PERIPHERAL CD4+CD25+FOXP3+T REGULATORY CELLS IN PATIENTS WITH SPONDYLOARTHRITIS-RELATED OCULOUPATHY

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Background: Spondyloarthropathy is a group of systemic chronic autoimmune diseases, which is characterised by the spine, peripheral joint, joint tissue inflammation and high morbidity. And ocular inflammatory disorders are the most common and important extra-articular manifestations with unclear pathogenesis. The imbalance of T help 17 cells (Th17)/regulatory T cells is considered to be a pivotal cause of autoimmune diseases, their roles in spondyloarthropathy, especially the related oculoopathy, are rare studied.

Objectives: To explore the status of both absolute number and percentage of CD4 +CD25+Foxp3+T regulatory (CD4Treg) cells and Th17 cells in peripheral blood (PB) of patients with spondyloarthropathy-related oculoopathy.

Methods: Ninety six patients were enrolled, including fifty spondyloarthropathy without related oculoopathy (Group A), mean age of 43.23±11.49 years, and forty six spondyloarthropathy-related oculoopathy (Group B), mean age of 43.50±13.51 years. BD Trucount tubes with the lyophilized pellet of a known number of internal counting beads were used for determining absolute counts of total CD4 +T cells in PB and then calculating the absolute number of Th17 cells and CD4Treg. Ninety three healthy volunteers, matched for patients' age and gender, were also included for the estimation of CD4 +T cell subsets.

Results: As compared to healthy controls (median of CD4Treg cells: 33.06 cells/ul), the frequencies of circulating CD4Treg cells were significantly decreased in both spondyloarthropathy without related oculoopathy (median: 25.07 cells/ul, $p < 0.05$) and spondyloarthropathy-related oculoopathy (median: 17.65 cells/ul, $p < 0.001$). The median ratios of Th17/CD4Treg cells in each group of patients were greatly higher than those of healthy volunteers [Group A: 0.29 (0.22, 0.47) vs. 0.21 (0.15, 0.34), $p < 0.01$; Group B: 0.32 (0.21, 0.55) vs. 0.21 (0.15, 0.34), $p < 0.01$]. Nevertheless, there were not significantly different in circulating Th17 cell changes among the three groups. Moreover, there was more absolute reduction of peripheral CD4Treg cells in Group B than Group A ($p = 0.006$), while greater increase in the ratio of Th17/CD4Treg despite no statistical significance ($p > 0.05$).

Abstract THU0229 – Figure 1. The numbers of different CD4+ T cells were compared between various groups and healthy controls. (A) The absolute counts of CD4Treg and Th17 cells were compared among various groups; (B) The ratios of Th17/CD4Treg cells were compared among various groups. HC: Healthy Controls, Group A: Spondyloarthropathy Without Related Oculoopathy, Group B: Spondyloarthropathy-related Oculoopathy. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Conclusions: The reduction of CD4Treg but not the elevation of Th17 cells may be the major reason for imbalance of Th17/CD4Treg. It is speculated that spondyloarthropathy-related oculoopathy is an autoimmune disease triggered by the defect of immunotolerance. More importantly, the recovery of CD4Treg may be a potential target treatment for patients with spondyloarthropathy-related oculoopathy.

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