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Original Article

Analysis of evidence to determine the link between Takayasu's arteritis and Tuberculosis

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ABSTRACT

Objective: The relationship of Takayasu's arteritis (TA) and Tuberculosis (TB) has been suggested for decades but convincing evidence is lacking. The aim of this study is to assess the published evidence for an association between TA and TB.

Method: We performed a systematic search of the MEDLINE database through PubMed using MeSH headings and keywords for "Takayasu's arteritis" and "Tuberculosis".

Results: Thirty seven publications were analysed. The sites of TB lesions in these TA cases were mainly found in lymph nodes and lungs and occasionally in the internal organs and skin. One histopathological study did not support the direct role of mycobacterium TB in the pathogenesis of arterial lesions while the other suggested that the arterial damage could occur due to previous TB infection. Regional differences in the prevalence of TB may have influenced the validity of the results. The laboratory studies support the idea of molecular mimicry between mycobacterium heat shock protein (mHSP65) and its human homologue (hHSP60) driving immune response in TA. Based on the epidemiological, immunological and genetic factors, three hypotheses have been proposed to explain the TA and TB link.

Conclusions: The mycobacterium theory can neither be confirmed nor excluded with certainty. The proposed hypotheses require future confirmatory studies. Randomised controlled trials are needed to ascertain safety of biologics in TA cases with associated TB infection.

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1. Introduction

Takayasu's arteritis (TA) is a large vessel vasculitis predominantly affecting the aorta and its branches. The aetiology of TA is still unknown, but infectious agents and genetic factors play a significant role in its pathogenesis. A link between Tuberculosis (TB) and TA has been suggested for a long time based on several observations. These include the fact that TA was originally thought to be more common in young females from Asia, Africa and South America.^{1–3} Secondly, granulomatous lesions such as the Langerhans's type giant cells and granulomas that are found in TB, have also been described in TA.⁴ Lastly, several case series and anecdotal case reports of simultaneous occurrences of TA and TB are available in the literature.^{5–17}

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However, the documentation of TA cases in the United States, North Europe and other high-income regions with low incidence of Tuberculosis makes the link between these two diseases questionable. 6

We investigated the evidence of the association between TA and TB, and evaluated the level of evidence in the published studies.

2. Materials and methods

2.1. Search strategy and selection criteria

We searched the PubMed database by using the keywords "Takayasu's arteritis" (Me SH Term), "Takayasu's" (all fields) & "arteritis" (all fields), or "Takayasu's Arteritis" (all fields), each combined with "Tuberculosis" (Me SH term) or "Tuberculosis" (all fields). We included only those studies that were published from 1st January 1981 to 31st December 2013. Relevant articles were selected using a 2-step approach. First step comprised of screening the titles and abstracts of the identified references in order to exclude articles that did not deal with the topic of interest. Second step included the reviewing of the full text of relevant articles. The references of the studies included were manually screened to locate further papers.

2.2. Data collection and analysis

A total of 82 articles were identified using PubMed. However, 57 articles were excluded due to reasons mentioned in Fig. 1. Upon manual screening of references within the remaining 25 articles, 12 additional articles were identified, and a sum total of 37 full text articles were included in our analysis. For each included study, data was extracted by all three authors independently. Any discrepancies were resolved by discussion. This was then entered into a database by one of the authors (ARC) and checked by the remaining authors. Articles were assessed using the following variables: author(s), country, year of publication, number of patients, age including mean and range, clinical findings, laboratory and histological methods employed, and conclusion on whether or not the study favours the TA and TB link. Also, a note was taken to evaluate whether the study discussed therapeutic strategies in TA cases within context of associated TB.

2.3. Study characteristics

The characteristics of 25 studies were considered. These included 4 case series and 3 autopsy series (Table 1), 13 case reports favouring TA and TB link (Table 2), and 5 laboratory studies (Table 3).



Fig. 1 - Search result using Pubmed Advanced Search Buillder.

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