The Relation between Chlamydia pneumoniae Infection and Abdominal Aortic Aneurysm: Case-Control Study

Due to recent interest in the role of Chlamydia pneumoniae as a pathogen of the vascular system, a case-control study was conducted to investigate the association between serological evidence of infection with C. pneumoniae and the occurrence of abdominal aortic aneurysm. Detectable IgG antibody to C. pneumoniae was more common among abdominal aortic aneurysm cases than among control patients (adjusted odds ratio, 5.97; \( P = .08 \)), as was detectable IgM antibody (10% vs. 0%; \( P = .02 \)). These findings suggest that infection with C. pneumoniae may play a role in the pathogenesis of abdominal aortic aneurysm; therefore, further research in this area is warranted.

Recently, a number of studies have shown an association between atherosclerosis and Chlamydia pneumoniae infection [1–3], and there is a growing interest in this line of etiologic investigation.

Although the etiology of abdominal aortic aneurysm (AAA) has traditionally been ascribed to aortic atherosclerosis, there is increasing scientific evidence suggesting that the pathogenesis of AAA is more complex per se than atherosclerosis [4]. Some case series have described the presence of C. pneumoniae in AAA tissue [5, 6]; however, the lack of a control group renders the etiologic significance of these findings uncertain. We conducted a case-control study to investigate the relationship between serological evidence of infection due to C. pneumoniae and AAA.

This investigation was based on a subset of participants in a case-control study of risk factors for AAA. Case patients were persons diagnosed with AAA in the ultrasound department at 1 of the 2 tertiary-care hospitals in Winnipeg, Canada, from 1992 through 1995. Control patients were selected at random from among those who underwent abdominal ultrasound for indications that were similar to those of the case patients (i.e., suspected aneurysms vs. other indications) but who did not have an AAA. Analysis was restricted to 81 of the 98 original case patients and 56 of the 102 original control subjects on the basis of availability of leftover frozen serum specimens.

Data relating to sociodemographic characteristics and putative risk factors for AAA were collected by interview. Serum samples were stored at \(-70^\circ\text{C}\) until analysis. C. pneumoniae strain AR-39 was grown in HL cells and used as antigen in the microimmunofluorescence test [7]. Formalin-fixed whole elementary bodies of AR-39 were fixed to microscope slides, and sera were diluted 2-fold, beginning at 1:16 to 1:2048. IgG, IgA, and IgM serum antibody fractions were measured by use of fluorescein isothiocyanate-conjugated heavy chain specific goat anti-mouse IgG, IgA, or IgM. The end-point titer was recorded as the final dilution, giving a discrete fluorescent pattern to the C. pneumoniae elementary bodies.

We grouped serum IgG titers into 4 categories that corresponded to serum titers of \(<1 : 16, 1 : 16 to 1 : 128, 1 : 256 to 1 : 512, \text{and } \geq 1 : 1024\), to approximately balance the distribution of patients who had detectable antibody levels. The OR, exact 95% CI, and Fisher’s exact \(P\) value (two-sided) were computed to examine the crude association between antibody levels and AAA. Unconditional logistic regression was used to estimate adjusted ORs.

Detectable IgG antibody was more common among case patients (96.3%) than control patients (87.5%; OR, 3.71; 95% CI, 0.79–23.1; \( P = .09 \); table 1). After adjustment for age, sex, pack-years of smoking, blood pressure, and indication for ultrasound, the presence of detectable IgG antibodies remained positively associated with AAA (adjusted OR, 5.97; 95% CI, 0.83–43.2; \( P = .08 \)). Case patients were also more likely than control patients to have detectable (titer, percentage distribution of patients who had detectable antibody levels. The

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\text{IgG antibody titer} & \text{Percentage of distribution} & \text{Crude OR} & \text{Adjusted OR}^a \\
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\text{Case patients (n = 81)} & \text{Control patients (n = 56)} & \text{95% CI} & \text{P} & \text{95% CI} & \text{P} \\
\hline
<1 : 16 & 3.7 & 12.5 & 3.57 (0.68–23.8) & 0.16 & 5.32 (0.67–42.2) & 0.11 \\
1 : 16 to 1 : 128 & 32.1 & 30.4 & 3.11 (0.61–20.5) & 0.17 & 9.58 (0.74–12.5) & 0.08 \\
1 : 256 to 1 : 512 & 34.6 & 37.5 & 5.09 (0.91–35.0) & 0.06 & 7.50 (0.79–71.1) & 0.08 \\
\geq 1 : 1024 & 29.6 & 19.6 & 3.71 (0.79–23.1) & 0.09 & 5.97 (0.83–43.2) & 0.08 \\
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\( ^a \text{Adjusted for age, sex, income, pack-years of smoking, systolic and diastolic blood pressure, and indication for ultrasound.} \)

Table 1. Chlamydia pneumoniae antibody titer distribution in abdominal aortic aneurysm case and control patients and crude and adjusted ORs for the presence of IgG antibodies to C. pneumoniae in relation to abdominal aortic aneurysms.
We found that serological evidence of past infection with *C. pneumoniae* is positively associated with AAA. However, cautious interpretation of these results is warranted. A restricted sample size resulted in imprecise OR estimates. Furthermore, the pathological implications of serological evidence of *C. pneumoniae* infection are uncertain. Nevertheless, these findings may lead to important insights into the etiology and pathophysiology of AAA. Infection of aortic tissue by other infectious agents, chiefly *Treponema pallidum*, has long been recognized as a cause of AAA. In vitro and animal model studies have shown that the arterial system is a potential target tissue for *C. pneumoniae* infection [8, 9], and at least 2 studies have demonstrated that AAA tissue often harbors evidence of infection [5, 6]. In addition, a recent study discovered *C. pneumoniae*–specific T lymphocytes among in vivo activated cells from AAA tissue, suggesting that *C. pneumoniae* might be more than an “innocent bystander” [10]. Further research into the possible etiologic role of *C. pneumoniae* in aortic aneurysm is warranted.

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Possible Malignant Transformation of Benign Lymphoepithelial Parotid Lesions in Human Immunodeficiency Virus–Infected Patients: Report of Three Cases

Benign lymphoepithelial parotid lesions (BLL) are intraparotid pathological changes that are commonly thought to be an early manifestation of human immunodeficiency virus (HIV) infection. It is not well known whether BLL may undergo malignant transformation into B cell lymphoma and may therefore be a sort of precancerous lesion. We report 3 cases of possible malignant transformation of BLL in HIV-infected patients.

Benign lymphoepithelial parotid lesions (BLL) are frequently seen in patients infected with human immunodeficiency virus (HIV) and are easily diagnosed by means of ultrasonography, given the typical presence of glandular cysts with thick internal septa [1]. It is possible that these lesions represent a favorable prognostic factor as regards HIV-disease progression, both in children and adults [2, 3]. Furthermore, they may act as a viral reservoir, similar to peripheral lymph nodes [4]. It is not clear, however, whether BLL may undergo malignant transformation into non-Hodgkin’s lymphoma (NHL) and therefore represent a sort of premalignant lesion. Here we report 3 cases of HIV-infected patients in whom ascertainment or presumable BLL preceded the occurrence of NHL.

A 61-year-old man was treated as an outpatient at our clinic in January 1996 because of indolent swelling of the left parotid gland with xerostomia. His CD4+ cell count was 191 cells/µL and his CD8+ cell count was 1464 cells/µL. An ultrasonographic study showed the presence of cysts compatible with benign lymphoepithelial parotid lesion (BLL; figure 1 A), and a fine-needle aspiration under sonographic guidance (advanced to the