Response to Letter by Cheong Regarding Article, “Association Between Stroke and Patients With Pelvic Inflammatory Disease: A Nationwide Population-Based Study in Taiwan”

Response:

We thank Dr. Cheong for his careful reading of and suggestions for our articles.1 The clinical diagnosis of pelvic inflammatory disease (PID) is notoriously difficult.2 Subclinical PID, acute PID, chronic PID, and tubo-ovarian abscess (TOA) were indicated as upper genital infection in female reproductive system. In clinical experience, PID is usually accompanied by lower genital tract infection. In pathological experience, PID is a polymicrobial infection heralded by the acquisition of a sexually transmitted pathogen and results in increasing spread of aerobic and anaerobic vaginal bacteria.3 The original idea of this study was to evaluate the impact of female genital tract infection on the prevalence of stroke. Furthermore, bacterial vaginosis, a common lower-genital infection, is not associated with PID, but specific subgroups of patients with bacterial vaginosis that may be difficult to identify clinically are at increased risk for PID.4

All ICD-9-CM codes 614 to 616 were included in our study. We are sorry to cause confusion with the loose inclusion criteria of PID in this study. Actually, the prevalence of PID would depend on the diagnostic criteria applied. Furthermore, because this study comprised patients who visited ambulatory care centers for 2 years between January 1, 2004 and December 31, 2005, it should be double the PID prevalence of 1 year; therefore, the prevalence of PID in this study should be higher than usually reported. If ICD-9-CM code 616 was to be excluded and age was to be restricted to between 15 and 44 years, the study cohort would have included 11 705 cases, which indicated 3% to 4% prevalence of PID in our data.

We also agree that acute PID usually occurs in young and sexually active women, but women age ≥45 years were also at risk for pelvic infection, especially for chronic PID and TOA.3 Halperin studied the relationship between age and PID and suggested there is probably a new trend in the epidemiology of TOA in older women who do not present with traditional risk factors for PID and TOA.5 Furthermore, the incidence of stroke might be increased in women of advanced age. Therefore, older women with PID might be at high risk for stroke; this is why our study extended the range for age with PID in including criteria. To prevent the bias from various incidences in PID among different age populations, we had already performed an age-matched study, illustrated in the table of original article,1 which showed similar age distribution control and studied groups. We believe the possibility of studied bias from prevalence of PID among different groups will be minimized.

We cannot agree more that severity of PID might correlate with risk of stroke. C-reactive protein is an important marker for evaluation of the severity of PID and/or TOA in clinical practice. Because elevated levels of C-reactive protein might be associated with stroke, it is fair to propose a positive relationship between severity of PID and risk of stroke. Women with subclinical, mild, acute, chronic PID and TOA should have variance in risk of stroke. Unfortunately, our database did not have enough power to identify those differences. We reanalyzed our data for stroke in patients with PID compared with control patients age 15 to 44 years, women diagnosed with lower genital infection (ICD-9-CM code 616, adjusted hazard ratios [HRs], 1.67; 95% CI, 1.35–2.07) demonstrated a nonsignificant lower risk of stroke than did women diagnosed with upper genital infection (ICD-9-CM code 614–615; adjusted HR, 1.74; 95% CI, 1.25–2.41). We also found women with lower genital tract infection demonstrated a significantly higher risk of stroke than did control patients (adjusted HR, 1.67; 95% CI, 1.35–2.07). Therefore, we might also extend our conclusion to say that women with genital tract infection, regardless of whether upper or lower genital tract, might be associated with stroke.

Disclosures

None.

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