Fibromyalgia Increases the Risk of Coronary Heart Disease: A Population-Based Cohort Study

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## Faculty Disclosure

<table>
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<tr>
<td>Conflicts of Interest:</td>
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Goals and Objectives

• Session Goal:
  – To present evidence from a cohort study regarding the association of fibromyalgia with risk of coronary heart disease.

• Session Objectives:
  – Objective #1: to present the design of a cohort study using clams data.
  – Objective #2: to discuss the evidence supporting the role of fibromyalgia in predicting future coronary heart disease.
• Increased production of ROS in mitochondria, accumulation of mitochondrial DNA damage, and the resultant mitochondrial dysfunction are associated with atherosclerosis and coronary heart disease (CHD).

• Mitochondrial dysfunction has been implicated in the development and maintenance of fibromyalgia.

• Inflammation has been implicated in the pathogenesis of both CHD and fibromyalgia.
CHD and fibromyalgia, two seemingly unrelated diseases, may share the same underlying pathophysiological mechanisms, namely mitochondrial dysfunction and inflammation.

Thus, it is reasonable to infer that an association exists between fibromyalgia and a subsequent CHD event.
Aim & Hypothesis

• To examine whether fibromyalgia patients have an increased risk of coronary heart disease (CHD), compared with age- and sex-matched control patients.

• Hypothesis: Fibromyalgia increases the risk of adverse coronary events.
Methods (1)

• **Design**: a matched-cohort study design

• **Data Source**: the Longitudinal Health Insurance Database (LHID) 2000 released by the National Health Research Institutes, Taiwan. The LHID2000 includes medical claims data and registration files for 1 million enrollees randomly selected from the 2000 Registry for Beneficiaries (n = 23.72 million) of the National Health Insurance program.
Methods (2)

• **Study Cohort:** Between January 1, 2000, and December 31, 2007, patients treated for fibromyalgia at least once a month for 3 consecutive months following their initial diagnosis were enrolled in our study.

• **Comparison Cohort:** Patients with no history of fibromyalgia or cancer-related pain and matched to each fibromyalgia patient based on age and sex at a frequency of 1:3.
Confounders (3)

- Age
- Sex
- Comorbidities
  - diabetes mellitus
  - Hypertension
  - Hyperlipidemia
  - alcohol-related illnesses
  - Obesity
  - COPD
  - Depression
- Influenza vaccination
- The number of visits to cardiology clinics
- antidepressants use
- NSAIDs use
- Opioids use
- Cardiovascular medications
  - Nitrates
  - anti-platelet agents
  - angiotensin-converting enzyme inhibitors
  - beta-blockers, calcium channel blockers
  - Diuretics
  - angiotensin-II receptor blockers,
Methods (4)

• **Primary endpoint**: the composite of CHD events, including percutaneous coronary interventions and coronary artery bypass grafting procedures.

• **Statistics**: hazard ratios (HRs) and the 95% confidence intervals (CIs) were estimated using multivariate Cox proportional-hazards regression models.
Figure 1

LHID2000
1,000,000 individuals

10260 Non-fibromyalgia cohort
Matched by age and sex at a ratio of 1:3

3420 Fibromyalgia cohort

192202 Patients with a new primary diagnosis of fibromyalgia between January 1, 2000 and December 31, 2007

187348 Excluded
Diagnosis of fibromyalgia < 3 times

4854 Confirmed chronic fibromyalgia
Primary diagnosis
At least once per month
3 consecutive months

1434 Excluded
234 Age < 20
7 Unidentified gender
1186 History of fibromyalgia before January 1, 2000
46 History of coronary events before the first fibromyalgia diagnosis
Results

• Patients with fibromyalgia showed a significantly higher subsequent risk of a CHD event (adjusted HR = 2.19, 95% CI = 1.52 - 3.17, P<0.001) than the patients without fibromyalgia.
Figure 2

A subsequent coronary event-free survival rate

Time (years)

Fibromyalgia cohort
Non-fibromyalgia cohort
Conclusion

• Patients with fibromyalgia had at least twice the risk of a subsequent coronary event when compared to those without fibromyalgia.