Associations Between Cardiac Comorbidity Burden and Atrial Fibrillation Prevalence: A Real-World-Evidence Based Approach

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Background: In the aging US population, atrial fibrillation (AFib) is increasingly prevalent, affecting nearly 5% of individuals. While previous studies have identified independent risk factors such as heart failure (HF), coronary artery disease (CAD), hypertension (HTN), hyperlipidemia (HLD), and type 2 diabetes (T2D), less is known about how these conditions relate to AFib when co-occurring. We aimed to assess how frequently AFib is observed in individuals with one or more of these conditions and to estimate odds ratios associated with both individual and combined disease states.

Methods: We performed a retrospective analysis using the IU School of Medicine-Evansville RWEdataLab (CRC/Sidus Insights) cardiac database, which includes electronic health records for 3.5 million de-identified individuals. ICD-9 and ICD-10 codes were used to identify chronic forms of AFib, HF, CAD, HTN, HLD, and T2D. Adults 49+ were included and stratified by sex (total: 3.00M, 1.54M female). Odds ratios (ORs) along with their 95% confidence intervals (CIs) were calculated.

Results: AFib was more frequently observed among individuals with cardiac conditions and T2D. Heart failure demonstrated the strongest association with AFib with OR of 7.04 (95% CI: 6.95 – 7.12) in males and 8.12 (95% CI: 8.01 – 8.23) in females. Other conditions, such as CAD, HTN, HLD, and T2D were associated with elevated AFib odds, ranging from an OR of 2.47 with T2D to 6.38 with HTN. 20 ORs were calculated.

Clinical Implications and Future Direction:

These findings demonstrate that the odds ratio for AFib changes with different combinations of comorbidities, such as HF and HTN, which is consistent with current literature. Future work should involve multivariate models to control for confounders like healthcare utilization and treatment effects. Limitations include inability to determine temporality and causality. Longitudinal studies could help establish temporality and determine whether individuals with certain cardiometabolic profiles might benefit from targeted AFib screening.