Season of birth and cardiovascular mortality in atrial fibrillation: a population-based cohort study

Fauchier L.; Bisson A.; Bodin A.; Spiesser P.; Pierre B.; Clementy N.; Babuty D.
Tours Regional University Hospital, Hospital Trousseau, Tours, France

Funding Acknowledgements: Type of funding sources: None.

Background. Month and season of birth may be indicators for a variety of prenatal and early postnatal exposures and they have been associated with life expectancy in adulthood. It is suggested that people born in the autumn on the northern hemisphere live longer than those born during the spring or summer, who may have an increase in cardiovascular disease specific mortality. Only few studies have followed populations longitudinally and no study has investigated the relation between season of birth and mortality in patients with established cardiac conditions.

Methods. All patients with atrial fibrillation (AF) seen in an academic institution were identified in a database. We examined the clinical course of 8962 consecutive patients with AF seen over a 10-year period. The adverse outcomes were investigated during follow-up and we identified the causes of death. The relation between season of birth (autumn, winter, spring and summer) and mortality risk was assessed using Cox proportional hazard regression models using autumn as the reference. Analyses were also made separately for men and women.

Results. In these 8962 patients (age 70 ± 10 years, CHA2DS2VASc score 3.1 ± 1.7), 1253 deaths were recorded during a follow-up of 2.5 ± 3.0 years (median 1.2, interquartile 4.3 years, yearly rate of death 5.5%) and 97% of causes of death were identified. Cardiovascular deaths accounted for 54% and 43% for non-cardiovascular. The three main causes of death were heart failure (29%), infection (18%) and cancer (12%).

Season of birth was a significant predictor of cardiovascular mortality (overall p = 0.0006). The lowest mortality was seen for people born in autumn or winter and the highest mortality in those born in spring and summer. This was mainly related to a higher cardiovascular mortality in males (hazard ratio [HR] 1.46, 95%CI 1.10-1.93, p = 0.009 for males born in spring and HR 1.44, 95%CI 1.08-1.91, p = 0.01 for those born in summer when compared to males born in autumn as the reference) while this effect was not seen in women. In a model adjusted for age, CHA2DS2VASc score, HASBLED score, cardiovascular risk factors, other comorbidities, AF pattern, antithrombotic use and other cardiovascular drugs use, a higher cardiovascular mortality was still seen in males born in spring (adjusted HR 1.43, 95%CI 1.05-1.96, p = 0.03) or in summer (adjusted HR 1.46, 95%CI 1.07-1.99, p = 0.02) when compared to those born in autumn while this was not seen in women.

Conclusion. Birth in spring or summer is associated with a higher risk of cardiovascular mortality in male AF patients. Further studies should aim at clarifying the mechanisms behind this association, which would support the so-called fetal origins hypothesis.