Preterm birth, abnormal foetal growth and the risk of atrial fibrillation later in life: a cohort study in Denmark, Finland and Sweden

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Background: Increasing evidence suggests that adverse birth outcomes, including preterm birth, small for gestational age (SGA) and large for gestational age (LGA), are associated with increased risks of hypertension, ischemic heart disease, stroke and heart failure. However, knowledge regarding their associations with atrial fibrillation (AF) is limited and inconsistent.

Objective: To investigate whether preterm birth, SGA and LGA are associated with increased risks of AF later in life.

Methods: We conducted a population-based cohort study involving 8,012,433 live singleton births based on the nation-wide Danish (1978–2016), Swedish (1973–2014) and Finnish (1987–2014) Medical Birth Registers. Information on birth outcomes, atrial fibrillation and covariates was obtained from nationwide health and socioeconomic registers. We estimated hazard ratios (HR) and 95% confidence intervals (CI) for AF according to preterm birth (<37 weeks), SGA and LGA (<10th and >90th birth weight for gestational age percentiles, respectively) with multivariable Cox proportional hazard models and flexible parametric survival models. We conducted sibling analyses to control for unmeasured familial risk factors.

Results: Preterm birth and LGA were associated with increased AF risks in both the full population cohort and in the sibling analyses; the multivariate HRs (95% CI) from the cohort analyses were 1.53 (1.37–1.71) and 1.55 (1.44–1.65), respectively. The associations were stronger with AF in childhood than in adulthood. Children born SGA had an increased risk of AF in the first 18 years of life, but not later.

Conclusions: Individuals born preterm or LGA had an increased AF risk independently of familial confounding factors. Individuals born SGA had an increased AF risk only during childhood. Persons born prematurely or with abnormal foetal growth may benefit from early screening and prevention to reduce the risk of AF later in life.

Figure 1

Adjusted hazard ratios and 95% confidence intervals for atrial fibrillation according to preterm birth, small for gestational age (SGA), and large for gestational age (LGA)