

### Congenital Heart Disease is Associated with the Development of Diabetes Mellitus: A Nationwide Study

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**Introduction:** An improved survival rate for children with congenital heart disease (CHD) has yielded a large population of adults living with CHD. It is important to understand this population's potential for acquired morbidity. The purpose of this study was to assess CHD survivors' risk of developing Diabetes Mellitus (DM) when compared to a non-CHD national cohort, and to determine risk factors that predispose CHD survivors to develop DM.

**Methods:** This retrospective cohort study aimed to include all Danish CHD survivors born from 1963-1984 alive at 30 years of age. CHD subjects born pre-1977 were previously identified by review of nationwide medical records. CHD subjects born between 1977-1984 were identified from the Danish National Registry of Patients (DNRP). For each CHD subject, 10 non-CHD subjects matched by sex and birth year were identified from the general population using the Danish Civil Registration System. Based on DNRP data, we computed cumulative risks and hazard ratios (HR) of time to diagnosis of DM from 1977 to 2013, and assessed for difference in the incidence of DM within the CHD cohort by specific demographic and clinical factors.

**Results:** We identified 5,295 CHD survivors. By 45 years of age, the cumulative risk of DM was 3% among CHD subjects (Figure). The HR of DM among CHD subjects compared to the non-CHD control population was 1.62 (95% CI: 1.33-1.97). CHD survivors born preterm had an elevated risk of DM (HR 12.58; 95% CI: 1.14-138.80), although those born term also had an increased HR (2.08; 95% CI: 1.21-3.57). Subjects with severe CHD had a HR of 2.17 (95% CI: 1.51-3.12), higher than among those with mild or moderate CHD (HR 1.45; 95% CI: 1.15-1.84). Those with cardiac surgery during the first year of life had a HR of 1.85 (95% CI: 1.06-3.22).

**Conclusion:** CHD survivors are at increased risk of developing DM. Adult CHD survivors born premature, with severe CHD, or requiring cardiac surgery during the first year of life were at higher risk. More research is needed to assess lifestyle elements in the CHD survivor population to determine interventions to mitigate the development of DM.

