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Abnormal Menstrual Patterns in Women with Congenital Heart Disease

Noritake K.(1), Ohuchi H.(1), Komori A.(1), Tanabe Y.(1), Yasuda K(1), Ideta K.(2)
Department of Pediatric Cardiology, National Cerebral and Cardiovascular Center, Osaka, Japan(1)
Department of Perinatology and Ginecology, National Cerebral and Cardiovascular Center, Osaka, Japan(2)

Background: Because of advances in treatment, most women with congenital heart disease (WCHD) have reached childbearing age. Recently, the influences of CHD on ovarian function with subsequent menstrual abnormalities have been described.
Objective: To investigate major menstrual disorders, age at menarche and menstrual cycle, and the determinant factors in WCHD.
Methods: From June 2011 to November 2013, after exclusion of patient with chromosomal disorders, 143 consecutive WCHD at National Cerebral and Cardiovascular Center (median age 27 years, ranged 16 to 77) completed a questionnaire about their menstrual patterns. Clinical variables included physique index (height, weight, body mass index: BMI, body fat percentage), diagnosis (cyanotic, non-cyanotic), New York Heart Association (NYHA) class, arterial oxygen saturation (SpO2), atrial and brain natriuretic peptides (ANP and BNP, respectively), peak oxygen uptake (PVO2), serum sex hormone levels, and thyroid function (TSH, fT3, fT4). We analyzed data using the JMP statistical program.
Results: The mean age of menarche was 13.2 ± 2.11 years. Precocious (<10 years) and delayed menarches (>15 years) were shown in one and 9, respectively. The mean age at menarche was older in the cyanotic WCHD than those without cyanotic (13.9 ± 0.2 vs. 12.1 ± 0.3 years, $p < 0.0001$). On univariate analysis, the delayed menarche was associated with greater NYHA class ($p = 0.02$), lower SpO2 ($p < 0.0001$), high levels of elevated ANP and BNP ($p = 0.01$, $p = 0.04$), low PVO2 ($p = 0.002$), low levels of testosterone ($p = 0.05$), high levels of TSH ($p = 0.003$), and body height ($p = 0.05$). Menstrual cycle disorders were seen in 58 WCHD (n = 40.8%), consisting of primary amenorrhea (n = 3, 2.1%), secondary amenorrhea (n = 8, 5.6%), polymenorrhea (n = 13, 9.2%), oligomenorrhea (n = 19, 13.3%), and the irregularity (n = 15, 10.6%). On univariated analysis, the prevalence of cycle disorders was significantly higher in the cyanotic WCHD than those without cyanotic diagnosis.
Conclusion: WCHD have a high prevalence of major menstrual disorders. The high proportion of menstrual disorders in WCHD suggests that ex-hypoxic hemodynamics in their childhood has a significant impact on the later ovarian function.