

Brugada syndrome gender influence on ECG and testosterone levels

Dr. Andrés R. Pérez Riera

The clinical Brugada phenotype is 9 times more prevalent in males than in females in patients with Brugada syndrome (BrS). BrS has been reported to be thinner than asymptomatic normal controls. Higher testosterone level associated with lower visceral fat may have a significant role in the Brugada phenotype and male predominance in BrS (1).

Brugada-like ECG confers a higher risk of prostate cancer independent of age, smoking habit, and radiation exposure. Men with a Brugada-like ECG should be regularly examined for prostate cancer and vice versa, especially elderly subjects (2).

In contrast to men, most women with BrS and resuscitated SCD or appropriate ICD shock do not have a spontaneous type-1 ECG pattern. Additionally, the degree of ST elevation is less pronounced in women than men. The predominance of the Brugada ECG phenotype in males is a result of the presence of a more prominent I(to) in males versus females (3). The presence of a more prominent Ito-mediated notch in the Epi of males predisposes males to the development of the Brugada phenotype and that a smaller Epi notch in females relegates them to development of progressive conduction problems under conditions in which inward currents are compromised (4).

While women represent a lower-risk group overall, risk factors established from a predominantly male population may not be helpful in identifying high-risk females (5). Cardiac autonomic neuropathy is an important risk indicator in BrS. Cardiac autonomic neuropathy is more common in men. Male gender, per se, is not an independent risk factor for development of ventricular arrhythmia but also cardiac autonomic neuropathy, which is an important risk factor in BrS, is more common in men; therefore men are susceptible to the development of cardiac events (6).

A history of syncope or SCD, the presence of a spontaneous Type 1 Brugada ECG, and male gender predict a more malignant natural history (7).

Men have a higher prevalence of early repolarization variant, AV block, carotid sinus syndrome, atrial fibrillation, supraventricular tachycardia due to accessory pathways, Wolff-Parkinson-White syndrome, reentrant ventricular tachycardia, ventricular fibrillation and sudden death, and the BrS.

The P-wave and P-R intervals are slightly longer in men than in women. On the other hand, women have a higher mean resting heart rate, a longer QT interval, a shorter QRS duration, and a lower QRS voltage than men. Women have a higher prevalence of sick sinus syndrome, inappropriate sinus tachycardia, atrioventricular nodal reentry tachycardia, idiopathic right ventricular tachycardia, and arrhythmic events in the long-QT syndrome (8). Women have higher resting heart rates than do men, but a longer rate-corrected QT_C interval. Women with the LQT1 and LQT2 variants of congenital long-QT syndrome (LQTS) are at greater risk of adverse cardiac events. Similarly, many drugs associated with acquired LQTS have a greater risk of inducing torsades de pointes (TdP)

arrhythmia in women than in men (9). The larger dispersion of I(Na) amplitude within the female cardiac ventricle may contribute to the higher risk of arrhythmias in this gender. By decreasing the transmural dispersion of I(Na), testosterone may exert a protective effect against LQTS-related arrhythmias in males (10).

References

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