Supraventricular Extrasystoles - ECG

Supraventricular extrasystole (SVES) is one of the most common abnormalities that is found in ECGs. The problem is caused by sinoatrial (SA) node itself or by other location in heart atria. The problem is premature emission of electric impulse that spreads throughout the atria and then it is transmitted to the ventricles. This causes an extra heart contraction related to presence of an extra QRS complex that is in irregular distance from other QRS complexes. The QRS complex produced by SVES has a normal thin appearance and is preceded by P wave. When the premature extrasystole comes from the sinoatrial (SA) node, the P wave has the same shape of other P waves. When the signal comes from other location in the atria, the shape slightly changes. QRS complex corresponding to the SVES is followed by an incomplete compensatory pause*.

* Incomplete compensatory pause means that the sum of distances between the QRS complex before SVES and QRS complex after the SVES is less than double distance of two normal QRS complexes. This complicated sentence is better understandable from a picture (see below).

There is one SVES with a premature QRS complex (blue circle with full line). The shape of the P wave (dashed blue circle) is different from the others P waves and we can assume that the electric impulse has arisen somewhere in heart atria out of the sinoatrial (SA) node. The distance of QRS before and after the SVES is less than double RR distance, where RR is the distance of two normal QRS, i.e. it is the incomplete compensatory pause (red).

Note: A little tricky is the situation when SVES is present in a patient with complete bundle branch block (LBBB, RBBB). The QRS complexes are in such case wide and give impressions of ventricular extrasystoles.

Conclusion: SVES occurrence is usually not a significant finding and it occurs commonly. However, multiple SVES may mimic an irregular heart rhythm and sometimes even cause a mistake diagnosis of atrial fibrillation. Unlike the atrial fibrillation, however, there are always P waves present before the QRS complexes in SVES. Some people perceive the SVES as unpleasant feeling of irregular rhythm and palpitations with a good effect of administered beta-blockers.