

# Atrial fibrillation in the WPW syndrome during pregnancy

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## Introduction

Approximately 50% of patients with Wolff, Parkinson and White syndrome (WPW) will experience tachycardia during their life. Although any type of arrhythmia may occur, the most frequent ones are atrioventricular re-entrant tachycardia (AVRT) in two-thirds of patients and paroxysmal atrial fibrillation (PAF) in one-third of cases [1]. The occurrence of PAF is of concern because fibrillatory impulses may reach the ventricles at a rapid rate causing circulatory collapse and even ventricular fibrillation [2]. Some reports have indicated that pregnancy may predispose asymptomatic patients with WPW to tachyarrhythmias [3-4]. In a computerized literature search, only two reported cases described atrial fibrillation complicating WPW syndrome in pregnancy [5-6]. We report two patients with WPW syndrome who exhibited atrial fibrillation and syncope during pregnancy. Diagnosis, management and possible causes of PAF in pregnant women with WPW are discussed.

## Case series

**Case I:** A 26-year-old woman, gravida I, para 0, was admitted at 28 weeks of gestation to the emergency unit. Her main complaints were palpitations and syncope 20 minutes prior to presentation. Her electrocardiogram (ECG) (Fig. 1) revealed atrial fibrillation with a ventricular rate ranging between 220-410 beats per minute (mean 280) and a blood pressure of 70 mmHg systolic. This was successfully treated with direct current cardioversion (single shock of 100 W/sec). No fetal heart rate abnormalities were noted during external monitoring. The subsequent ECG showed WPW syndrome (Fig. 2). The patient denied any previous similar episodes. No cardiac abnormalities were detected by echocardiography. She was started on disopyramide, and the remaining course of pregnancy was uneventful. She had a smooth spontaneous term vaginal delivery of a live female newborn.

**Case II:** A 35-year-old woman, gravida III, para II was admitted to a private hospital at 30 weeks' gestational age. Her main complaints were palpitations and syncope one hour prior to presentation. In the emergency unit, according to her treating physician, she was hypotensive and was found in atrial fibrillation at a rate of 200 beats per minute. She was cardioverted with a

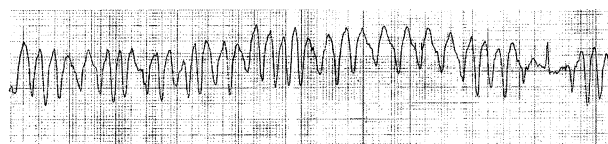


Figure 1. — Atrial fibrillation with fast ventricular response in case 1.

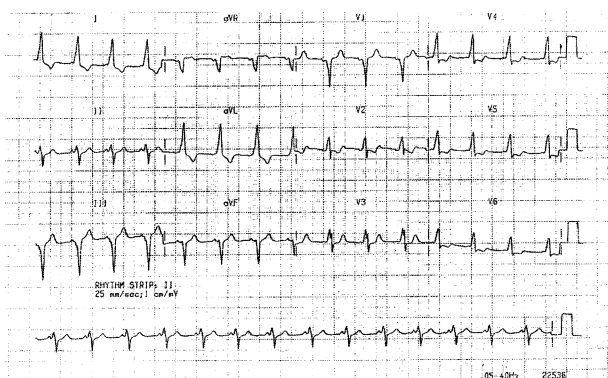


Figure 2. — Wolff-Parkinson and White pattern in case 1 during sinus rhythm.

single shock of 100 W/sec and transferred to our arrhythmia unit for further evaluation.

The patient reported similar episodes during her previous pregnancies but she was never investigated. Her ECG revealed WPW syndrome and the echocardiogram was normal. She refused to take any medication. No further episodes were reported and the pregnancy ended in a spontaneous term vaginal delivery of a live male newborn.

## Discussion

WPW syndrome, first described by Wolff, Parkinson and White in 1930 [7], is the most common form of ventricular preexcitation having an anomalous pathway connecting the atrium directly to the ventricle as the anatomic basis. It affects males more than females and is found in all age groups with familial prevalence reported sporadically [8]. The classical WPW pattern which occurs in 0.1-3 per thousand ECGs includes a short PR interval ( $\leq 0.12$  sec), a Delta wave and a wide QRS complex ( $\geq 0.12$  sec) [1]. The exact incidence of WPW during pregnancy

is unknown. There is a high incidence of arrhythmias in young healthy women presenting with symptoms of palpitations during pregnancy [9]. These arrhythmias consist mostly of atrial premature complexes (APCs) and ventricular premature complexes (VPCs).

Several mechanisms have been proposed to explain the incidence of arrhythmias in pregnancy. These include hemodynamic [10], autonomic [11], and hormonal [6] changes occurring in pregnancy. In brief, a physiologic increase in heart rate and increase in sex hormones which modulate neurotransmitters in various tissues play a role in the genesis of arrhythmias by modifying the effective refractory period, velocity of conduction and spatial dispersion of refractoriness in atrial and ventricular tissue [12]. Atrial fibrillation in patients with WPW syndrome may lead to syncope, ventricular fibrillation and sudden death. APCs and accessory pathway (AP) play an important role in the genesis of atrial fibrillation in this group of patients [13]. When atrial fibrillation complicating WPW syndrome occurs during pregnancy there is risk to the fetus from the associated hemodynamic changes and from the antiarrhythmic therapy.

The objective of therapy of rapid atrial fibrillation with hemodynamic compromise is restoration of the sinus rhythm by immediate electrical cardioversion, a relatively safe procedure during pregnancy [14]. Once sinus rhythm is restored the aims in prophylaxis are to prevent APCs and to block accessory pathway conduction. In the Vaughan Wilkins classification of antiarrhythmic medications [15], class IA (quinidine, procainamide and disopyramide), and class IC (flecainide and propafenone) appear to be relatively safe [6, 16]. Class 3 (sotalol, amiodarone) have serious side-effects for the fetus and should only be used in life threatening conditions [5, 16]. Class 2 (B-adrenergic blocking agents), class 4 (calcium channel blocking agents) and digoxin should be avoided in WPW patients presenting with atrial fibrillation because they may decrease the refractory period of the accessory pathway leading to a high ventricular rate.

In conclusion, symptoms of palpitations in pregnancy should be carefully evaluated. Woman with known WPW syndrome should be monitored during pregnancy to prevent maternal and fetal morbidity. Although atrioventricular re-entrant tachycardia is more common than atrial fibrillation in this group of patients, this latter could be lethal. WPW syndrome is readily diagnosed on the surface ECG which should be done routinely on pregnant patients suffering from palpitations.

## References

- [1] Wellens H. J. J., Brugada P., Penn O. C.: "The management of preexcitation syndromes". *JAMA*, 1987, 257, 2325.
- [2] Klein G. J., Bashore T. M., Sclers T. D., Pritchett E. L. C., Smith W. M., Gallagher J. J.: "Ventricular fibrillation in the Wolff, Parkinson and White syndrome". *N. Engl. J. Med.*, 1979, 301, 1080.
- [3] Towam M., Levine J., Mendelson M., Goldberger J., Dyer A., Kadish A.: "Effect of pregnancy on paroxysmal supraventricular tachycardia". *Am. J. Cardiol.*, 1993, 72, 838.
- [4] Widerhorn J., Widerhorn A. L. M., Rahmitoola S. H., Elkayam U.: "WPW syndrome during pregnancy: increased incidence of supraventricular arrhythmias". *Am. Heart J.*, 1992, 123, 796.
- [5] McKenna W. J., Harris L., Rowland E., Whitelaw A., Storey G., Hole' D.: "Amiodarone therapy during pregnancy". *Am. J. Cardiol.*, 1983, 51, 1231.
- [6] Gleicher N., Meller J., Jandler R., Sullum S.: "Wolff-Parkinson White syndrome in pregnancy". *Obstet. Gynecol.*, 1981, 58, 748.
- [7] Wolff L., Parkinson J., White P. D.: "Bundle branch block with short PR interval in healthy young people prone to paroxysmal tachycardia". *Am. Heart J.*, 1931, 5, 685.
- [8] Schneider R. G.: "Familial occurrence of Wolf-Parkinson-White Syndrome". *Am. Heart J.*, 1969, 78, 34.
- [9] Shotan A., Ostrzega E., Mehra A., Johnson J., Elkayam U.: "Incidence of arrhythmias in normal pregnancy and relation to palpitations, dizziness and syncope". *Am. J. Cardiol.*, 1997, 79, 1061.
- [10] Hunter S., Robson S. C.: "Adaptation of maternal heart in pregnancy". *B. Heart J.*, 1992, 68, 540.
- [11] Wilkinson M. H., Pearce M., Wilson C.: "Radioligand binding studies on hypothalamic noradrenergic receptors during the estrous cycle after steroid infection in ovariectomized rats". *Brain Res.*, 1979, 168, 652.
- [12] Schwartz P. J., Priori S. G.: "Sympathetic nervous system and cardiac arrhythmias". In: Zipes PD, Jalife J., eds. "Cardiac electrophysiology: from cell to bedside". Philadelphia WB. Saunders Co., 1990, 330, 43.
- [13] Pietersen A. H., Andersen E. D., Sandøe E.: "Atrial fibrillation in the Wolff, Parkinson, White Syndrome". *Am. J. Cardiol.*, 1992, 70, 38A.
- [14] Shroder J. S., Harrison D. C.: "Repeated cardioversion during pregnancy". *Am. J. Cardiol.*, 1971, 27, 445.
- [15] Vaughan Williams E. M.: "A classification of antiarrhythmic actions reassessed after a decade of new drugs". *J. Clin. Pharmacol.*, 1984, 24, 129.
- [16] Rage R. L.: "Treatment of arrhythmias during pregnancy". *Am. Heart J.*, 1995, 130, 871.

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