



CASE REPORT

# Wolff-Parkinson-White Syndrome in a Pregnant Female: A Case Report

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Received: 14 July 2021 / Accepted: 22 September 2021 / Published online: 22 March 2022  
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## Introduction

The most common arrhythmia in women of reproductive age is paroxysmal supraventricular tachycardia (PSVT). Wolff-Parkinson-White (WPW) syndrome accounts for the majority of supraventricular tachycardia (SVT) in this population with incidence of 1.2 per 1000 people [1]. WPW syndrome is electrocardiographic syndrome which is the expression of anomalous atrioventricular conduction pathway. It is most common in younger age group without any structural heart disease. The incidence of pre-excitation syndromes in the usual population is rare but the associated tachyarrhythmia's occurrence is frequent and ranges as of 10% in young adults to 30% in the elderly.

## Case Report

A 40-year-old female with pre-pregnancy BMI of 26.08 (height 152 cm and weight 60 kg), G2 P1 L1 at 39 weeks and 5 days of gestation was presented in the emergency department with complaints of palpitations and fatigue for the past 10 days. The patient was a known case of hypothyroidism and gestational hypertension. Her first and second trimester were uneventful except the presence of on and off palpitations while doing heavy work. The patient's hemodynamic monitoring, BP, HR, pulse oximetry, were continuously done. The patient remained clinically stable throughout, awake and talking with no symptoms and with a normal blood pressure between 120 and 140 mm of Hg systolic and 90–100 mm of Hg diastolic. Her heart rate was 120–140 bpm with a saturation of 98–100% on room air. On auscultation, her chest was clear. Her physical examination, basic blood investigations were normal. Electrocardiography

(ECG) was done which revealed short PR interval (PR interval < 120 ms), wide QRS complex (QRS > 120 ms) and delta wave (slurred upstroke of QRS complex). Two-dimensional echocardiography did not show any abnormality. Nonstress test (NST) was done, which was reactive. Fetal heart was monitored throughout and remained normal (Fig. 1).

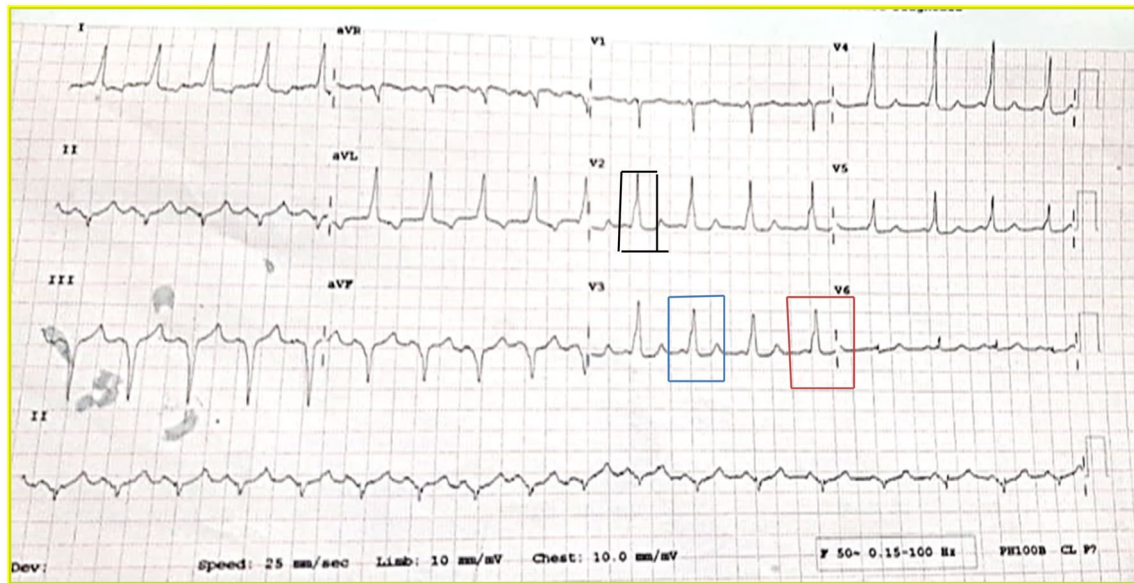
All anti-arrhythmic drugs and defibrillator was kept ready to deal with any untoward events. Conservative measure in the form of carotid massage and valsalva maneuver was tried but failed to correct the pulse. Opinion from cardiology, medicine and anesthetic team was taken, and patient was planned for normal vaginal delivery. Tab. Metoprolol 25 mg was added as per cardio opinion to suppress the AV node conduction. Tab. Mifepristone 200 mg was given followed by augmentation with low and concentrated dose of oxytocin. 100% oxygen by Hudson mask was started @ 6 L/min until delivery of baby. Labor progressed well and forceps were applied to cut short the second stage of labor. Baby boy was born in good healthy condition with APGAR score of 10 at first and fifth min, respectively. Oxytocin 10 units I.M. was given after delivery of baby, and 20 units IV slowly in 500 ml RL was given after placental expulsion. Proper analgesics were given to avoid any sympathetic stimulation. No arrhythmias occurred in intrapartum and postpartum period. Oral metoprolol 25 mg twice a day was continued, and maternal pulse was kept around 90 bpm. Following ECG monitoring, patient was stable and taken to the ward and was discharged on Tab. Metoprolol 25 mg twice daily and followed up with cardiologist.

## Discussion

Wolff-Parkinson-White syndrome is a rare congenital heart disorder characterized by the presence of an accessory pathway that predisposes to tachyarrhythmia and sudden death. Although it is mainly asymptomatic, in some cases, it leads to significant morbidity and rarely mortality. Supraventricular tachycardia (SVT) is a complication of WPW syndrome which is defined as intermittent pathological and usually

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**Fig. 1** ECG showing slurred upstroke of QRS complex (Delta wave), wide QRS complex and short PR interval as marked in lead V2 and V3 of the ECG indicative of WPW syndrome

narrow complex tachycardia > 120 bpm which originate above the ventricles excluding atrial fibrillation, flutter and multifocal atrial tachycardia [2]. In this case report, an attempt was made to study the diagnosis, risk factors and management of WPW syndrome in third trimester of pregnancy. Our patient was diagnosed with WPW syndrome in her first pregnancy 7 years ago at Bebe Nanki Maternal and Child Care Centre, Amritsar, and had normal outcome. Outlet forceps were applied to cut short the second stage of labor in her previous pregnancy also. Upon discharge, the patient was advised cardiology opinion from where the patient was regularly taking the medications for 1 year. After 1 year, she did not follow up in the cardiology department and took on and off homeopathic medicines. She was asymptomatic during this period. Then, the patient conceived spontaneously after 7 years from her first pregnancy and had regular antenatal checkups at Civil Hospital, Amritsar. Now, the patient was presented in our department at 39 weeks 5 days of gestation with palpitations and tachycardia. Her ECG findings were consistent with those seen in WPW syndrome.

The normal physiological increase in heart rate in pregnancy can result in decreased PR, QRS and QT intervals and mimic WPW syndrome. Also, the physical effect of the gravid uterus can cause the ECG axis to shift to the left [2]. There is an intermittent nature of the occurrence of symptoms in WPW syndrome; hence, 24-h ECG monitoring is often required. In some other studies on WPW syndrome in pregnant females, Dennis and Gerstman [2] conducted a study in which a multiparous woman in the third trimester of pregnancy developed supraventricular tachycardia and induction of labor rather than cesarean section was

considered the best option. However, in a study by Devi and Rao [1], a 20-year-old multiparous woman with breathlessness and WPW syndrome, the termination of the pregnancy was done by cesarean section.

Asymptomatic patients at any gestational age do not require any treatment. Epidural analgesia can be given for pain relief. Non-pharmacological treatment including vagal maneuvers such as carotid massage, valsalva maneuver is well-tolerated. In acute SVT, most commonly drugs used are adenosine, calcium channel blockers and beta blockers. Adenosine, 6–12 mg i.v bolus, is the first choice of drug for termination of SVT. It is a rapidly acting drug with half-life of 10 s making it ideally suitable for use in pregnancy. If adenosine fails, beta blockers are agents of choice, where AV nodal blocking drugs lead to acceleration of conduction through accessory pathway and arrhythmias become sustained. In calcium channel blockers, verapamil is as effective as adenosine, and it helps to convert SVT to sinus rhythm. Digoxin can be used in all stages of gestation without causing any harm.

Epidural anesthesia is preferred because of hemodynamic stability. Synchronized electrical cardio version with 150–200 j is considered safe and can be used in pregnancy [3]. However, its use is limited in severe cases of SVT, cases not responding to medical management, particularly in hypotension. FHS monitoring is very critical due to the risk of developing bradycardia. Direct electrical current shock delivered to myocardium should be synchronized with the peak of QRS complex. Radiofrequency ablation is an authoritative and preventive treatment preferably performing in postpartum period. During pregnancy with malignant

tachyarrhythmia, implantable device can be used successfully. In bradyarrhythmias, temporary and permanent pacers can be used [4].

## Precautions and Conclusion

Certain drugs like atropine, glycopyrrolate and ketamine and any factor that increases the sympathetic activity such as pain, anxiety and stress should be avoided. Pre-loading and avoidance of AORTOCAVAL compression by using left lateral tilt to prevent decreased atrial filling should be encouraged to prevent hypotension. Oxytocin can also precipitate SVT, so low-dose oxytocin should be given and administered slowly as an IV infusion. Timely recognition of women's symptoms, acute diagnosis, multidisciplinary team management with obstetrics, cardiology, medicine and anesthesia department can help out with management of these women safely during intrapartum and postpartum period.

## Declarations

**Conflict of interest** The authors declare that they have no conflict of interest.

**Human or Animal Rights** All procedures performed in the study involving human participant were in accordance with the ethical standard

of the institutional and/or National Research Committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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