Mobitz Type II AV Block during Spinal Anesthesia

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Mobitz type II atrioventricular (AV) block is usually a life-threatening arrhythmia, but its occurrence during spinal anesthesia has not been described.

Case Report

A 32-yr-old woman was scheduled for a repeated cesarean section. She was healthy without any systemic disease. Her previous cesarean section was performed with a spinal anesthesia without event. Body height was 150 cm, and body weight was 58 kg. No premedication was given. In the operating room, automatic noninvasive blood pressure, pulse oximeter, and electrocardiograph (ECG) monitor were applied. Results of her initial ECG were normal (fig. 1A). Blood pressure was 112/64 mmHg, and the pulse rate was 78 beats/min. Hence she received an infusion of 1000 ml lactated Ringer’s solution before the administration of spinal anesthesia. Spinal anesthesia with 10 mg of hyperbaric 0.5% bupivacaine mixed with 0.2 mg of morphine was performed at the L3-L4 interspace. The patient was immediately turned in the supine position with left uterine displacement. The level of the block to pinprick was T5 bilaterally at 5 min. Blood pressure then decreased to 79/54 mmHg, so intermittent 8 mg of ephedrine boluses were given intravenously to maintain systolic blood pressure above 100 mmHg. Fifteen minutes later, her ECG revealed Mobitz type II AV block lasting 3 min (fig. 1B) followed by 2 min of sinus bradycardia with a heart rate of 55 beats/min (fig. 1C). The level of the anesthesia was T4. The patient’s vital signs regained stability before the beginning of operation. One healthy male baby was delivered about 25 min after injection of the spinal anesthesia. AV block reappeared for 2 min (fig. 1D) when the uterus was repaired. Afterward, the anesthesia course was uneventful. Four days later, 24-h Holter monitoring was carried out and revealed sinus rhythm with a rate of 57–117 beats/min and intermittent sinus arrhythmias with no dysrhythmia detected.

Discussion

There have been a few cases of severe bradycardia, Wenckebach type or complete AV block, during spinal anesthesia presented.1–5 Two mechanisms were discussed, but they remain controversial. One mechanism is the blockade of cardiac accelerators originating from the thoracic sympathetic ganglia. Another is vasovagal attack resulting from a decreased venous return. However, the relative increase in parasympathetic activity is most likely the final pathway. In our case, high spinal block (T4–T5) was performed for cesarean section. The loss of cardiac sympathetic stimulation and vasovagal attack were both possible mechanisms. Hence the relative increase in parasympathetic activity might have been the cause of the first episode of Mobitz type II block. Furthermore, exteriorization of uterus for repair may have enhanced parasympathetic activity and resulted in the secondary attack.

Usually Mobitz type II AV block is caused by disease of the His-Purkinje system and associated with a wide QRS complexes. It has a high incidence of progression to complete heart block with an unstable, slow, lower escape pacemaker. In such a situation, pacemaker implantation is indicated.6 However, the block with narrow QRS complexes may exist in the AV node and may be vagotonically induced.7–8 Atropine, which speeds AV node conduction, can decrease this type of block. The chance for the development of complete AV block may be very low.9

The QRS complexes of Mobitz type II block in our case were narrow as in the preceding ECG strip. Temporal imbalance of autonomic nervous system resulting from spinal anesthesia was the most possible cause of this block. Therefore, we performed only the 24-h Holter study and kept observing carefully.
Fig. 1. (A) Normal sinus rhythm before induction. (B) Mobitz type II atrioventricular (AV) block after induction. The heart rate intervals are prolonged, and conduction fails suddenly without progressively longer PR intervals. (C) Bradycardia with normal heart rate intervals at a rate of 55 after Mobitz type II AV block. (D) Mobitz type II AV block reappeared when the uterus was repaired.