RISK OF ADVANCED HEART BLOCK DURING EXTRADURAL ANAESTHESIA IN PATIENTS WITH RIGHT BUNDLE BRANCH BLOCK AND LEFT ANTERIOR HEMIBLOCK

P. CORIAT, A. HARARI, A. DUCARDONET, J.-P. TAROT AND P. VIARS

SUMMARY

Electrocardiographic recording by Holter monitoring demonstrated the absence of any modification, however minimal, of the infranodal conduction during surgical procedures under extradural anaesthesia in 20 patients with right bundle branch block (RBBB) and left anterior hemiblock (LAHB) but without symptoms. These data suggest that extradural anaesthesia can be used safely in patients with asymptomatic chronic RBBB and LAHB without prophylactic insertion of pacemakers. However, patients having experienced either syncope or transient Mobitz II second degree AV block are likely to have a trifascicular block and increased risk of advanced heart block during extradural anaesthesia.

Patients with e.c.g. findings of right bundle branch block (RBBB) and left anterior hemiblock (LAHB) may develop complete heart block (Lasser, Haft and Friedberg, 1968; De Pasquale and Bruno, 1973). During extradural anaesthesia the effects of absorption of lignocaine, the haemodynamic changes following extradural anaesthesia, and the surgical stress may impair conduction in the His-Purkinje system and cause complete A-V block.

The influence of surgery performed under extradural anaesthesia on A-V conduction in patients with RBBB and LAHB was assessed to determine the need for prophylactic temporary cardiac pacing. The conventional oscilloscope e.c.g. can show prolonged advanced heart block. However, conduction disturbances within the His-Purkinje system are often paroxysmal and transient, demonstrable only by isolated dropped P waves. As even one dropped QRS complex (Mobitz type II heart block) demonstrates a block in the His system, conventional oscilloscope monitoring is inadequate to detect paroxysmal and transient heart block. On the other hand, the Holter tape monitor (Holter, 1961) is an accurate means of detecting even transient and minor changes of A-V conduction. The method of scanning superimposes each P-QRS complex on the immediately preceding complex and permits detection of any increase in P-R interval or of a dropped P wave.

PATIENTS AND METHODS

All the e.c.g. tracings of patients undergoing a surgical procedure under extradural anaesthesia between September 1978 and September 1979 were screened for the presence of RBBB and LAHB. The criteria for e.c.g. diagnosis of RBBB included a QRS duration of more than 0.12 s with RSR, QR or a tall R wave in lead VI. LAHB was diagnosed when the mean frontal QRS axis was more negative than −30°, with the presence of a small Q and tall R waves in lead I or small R and deep S waves in lead III in the absence of either inferior myocardial infarction or emphysema (Criteria Committee of the New York Heart Association, 1973). Patients responding to these criteria were considered to have a bifascicular block. Twenty consecutive patients were selected according to these criteria. They were all in normal sinus rhythm without second degree A-V block; P-R interval ranged from 0.14 to 0.20 s. Their ages ranged from 53 to 86 yr (mean age 74 yr). The duration of bifascicular block was unknown in most patients; none had a previous history of syncope, or typical angina pectoris. The patients underwent the following operations: transurethral prostatectomy (15), suprapubic prostatectomy (two), insertion of femoral head prosthesis (two).

The Holter monitor (Oxford Medical Systems) was applied 2 h before extradural anaesthesia and

©Macmillan Publishers Ltd 1981
continued for up to 6 h after operation. One lead was recorded continuously before, during and after the operation.

In all patients there was continuous single-lead e.c.g. monitoring throughout the surgical procedure and in the recovery room. In each patient a 12-lead e.c.g. was taken before and after surgery. Cardiac pacemaking equipment was available in the operating room.

Patients were premedicated with diazepam 10 mg and atropine 0.5 mg i.m. 30 min before induction of extradural anaesthesia. Lignocaine was used for the extradural block, the mean dose being 200 ± 40 mg. The upper limit of analgesia ranged from T7 to T10.

RESULTS

No alteration of A–V conduction (that is second or third degree A–V block) was observed throughout the whole recording time in any patient. The P–R interval did not change during the period before operation, following extradural anaesthesia, or in the period after operation.

During the surgical procedure there were increases of P–R interval (+25%); once in two patients and twice in one patient (fig. 1). The increases in the P–R interval were associated with a sinus bradycardia, and the interval returned to the previous values when the bradycardia ceased. The changes occurred during short periods ranging from 1 to 2 min and terminated either spontaneously or following atropine 0.5 mg i.v. in one patient.

There were no significant differences between e.c.g. before and after operation in any patient and all had a normal postoperative course.

DISCUSSION

The present study was undertaken to determine if a surgical procedure under extradural anaesthesia impairs A–V conduction in patients with previous bifascicular block.

RBBB and LAHB are relatively common in elderly patients. Patients with a previous history of syncope, or Mobitz II second degree A–V block, require the prophylactic implantation of a permanent pacemaker (Narula et al., 1971). In asymptomatic patients with chronic RBBB and LAHB the distal conduction is adequate and prophylactic permanent pacing is not required (Gupta, Lichstein and Chadda, 1976; Kulbertus, 1976).

During anaesthesia and surgery a number of factors may compromise conduction and cause complete heart block, although no episode of advanced A–V trivascular block during general or

FIG. 1. Upper trace: normal sinus rhythm with P–R 0.2 s in the period before operation. Lower trace: increased P–R (0.27 s) during sinus bradycardia (47 beat min⁻¹).
spinal anaesthesia was recorded by standard e.c.g. monitoring (Rooney, Goldiner and Muss, 1976; Pastore et al., 1978).

Extradural anaesthesia is used frequently during operations on elderly patients, some of whom may have RBBB and LAHB. The absorption of lignocaine could impair A–V conduction; since lignocaine can slow infranodal A–V conduction (Rosen, Hoffman and Wit, 1975), and is capable of inducing heart block in patients with bundle branch block (Gupta, Lichstein and Chadda, 1974).

No significant alteration in A–V conduction was observed in this series. The only modifications were rare and transient increases of P–R, interval which occurred during the surgical procedure and were associated with a sinus bradycardia. These changes regressed at the termination of the sinus bradycardia, suggesting that an increase in vagal tone was responsible. Thus, such rare and transient slowing of the A–V conduction is likely to occur in the A–V node and not in the His–Purkinje system (Hamlin and Smith, 1968). Surgical procedures under extradural anaesthesia using lignocaine did not affect the infranodal conduction in these patients.

Acute cardiac ischaemia may induce advanced heart block (Rotman, Wagner and Wallace, 1972). As none of our patients had disabling coronary artery disease no conclusion can be drawn concerning the risk of advanced heart block in such patients.

Acute cardiac ischaemia may induce advanced heart block (Rotman, Wagner and Wallace, 1972). As none of our patients had disabling coronary artery disease no conclusion can be drawn concerning the risk of advanced heart block in such patients.

REFERENCES


RISQUE DE POULS PERMANENT PRONONCE AU COURS D’UNE ANESTHESIE EXTRADURALE CHEZ LES PATIENTS AYANT UN BLOC DE BRANCHE DROIT ET UN HEMIBLOC ANTERIEUR GAUCHE

RESUME

Un électrocardiogramme effectué à l’aide d’un appareil de surveillance de Holter a fait ressortir une absence de toute modification, aussi minime soit-elle, dans la conduction infranodale au cours d’interventions chirurgicales sous anesthésie extradurale sur 20 patients souffrant de bloc de branche droit (RBBB) et d’hémibloc antérieur gauche (LAHB), mais sans en avoir aucun symptôme. Ces données semblent indiquer que l’anesthésie extradurale peut être utilisée sans danger sur des patients souffrant de RBBB et de LAHB chroniques asymptomatiques sans insertion prophylactique de rythmiques. Cependant, les patients qui ont souffert de bloc auriculoventriculaire (AV) du second degré, soit avec syncope, soit avec Mobitz II transitoire, risquent d’avoir un bloc trifasciculaire et de présenter un plus grand risque de poul en permanent prononcé pendant l’anesthésie extradurale.

GEFAHR FORTGESCHRITTENEN HERZBLOCKS BEI EXTRADURALER ANÄSTHESIE IN PATIENTEN, MIT RECHTEM BÜNDELBLOCK UND LINKEM VORDEREM HEMIBLOCK

ZUSAMMENFASSUNG

EKG-Aufzeichnungen durch Holter-Messung zeigten die Abwesenheit auch der minimalsten Modifikation der infranodalen Leitung bei chirurgischen Eingriffen unter extraduraler Anästhesie bei 20 Patienten mit rechten Bündelblocks (RBBB) und linkem vorderen Hemiblock (LAHB), aber ohne Symptome. Dies zeigt, dass extradurale Anästhesie ohne Gefahr bei Patienten mit asymptomatischen chronischen
RBBB und LAHB angewendet werden kann, ohne prophylaktische Einsetzung von Schrittmachern. Patienten allerdings, die etweder Synkope oder vorübergehende Mobitz II AV-Blöcke 2 Grades erlebt haben, können einen trifaszikulären Block bekommen, und riskieren stark einen fortgeschrittenen Herzblock während der Anästhesie.

RIESGO DE BLOQUEO CARDIACO AVANZADO DURANTE ANESTESIA EXTRADURAL EN PACIENTES CON BLOQUEO DEL FASCICULO DERECHO Y SEMIBLOQUEO ANTERIOR IZQUIERDO

SUMARIO

El registro electrocardiográfico mediante detección Holter demostró la ausencia de toda modificación, por minima que fuere, de la conducción infranodal durante los procedimientos quirúrgicos efectuados bajo anestesia extradural en 20 pacientes que presentaban bloqueo del fascículo derecho (RBBB) y semibloqueo anterior izquierdo (LAHB) pero sin síntomas. Estos datos sugieren que la anestesia extradural puede usarse con seguridad en pacientes que presenten RBBB y LAHB crónico y asintomático sin tener que efectuar la inserción profiláctica de marcapasos. Sin embargo, los pacientes que hayan experimentado sincope o bloqueo AV de segundo grado del tipo Mobitz momentáneo son propensos a sufrir un bloqueo trifascicular y un mayor riesgo de bloqueo cardiaco avanzado durante la anestesia extradural.