PERIOPERATIVE ANALGESIA BY 3-IN-ONE BLOCK IN TOTAL HIP ARTHROPLASTY PROSPECTIVE RANDOMIZED BLIND STUDY

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In a prospective randomized blind study of 182 patients undergoing total hip arthroplasty, the patients per- and postoperative need for analgesics was assessed in two groups, one receiving general anesthesia and a 3-in-one block, the other group only general anesthesia.

Although we found a significant reduction in analgesics per- and postoperatively in the 3-in-one block group, the difference in analgesics was small and has no clinical relevance in the patient with a healthy cardiovascular status. We conclude that 3-in-one block in combination with light general anesthesia is not the anesthetic of choice in total hip arthroplasty using the posterior approach.

Keywords : regional anesthesia ; total arthroplasty ; hip.

Mots-clés : anesthésie régionale ; arthroplastie totale ; hanche.

INTRODUCTION

The 3-in-one block is an interfascial lumbar plexus blockade. With one injection of an anesthetic the obturator, the femoral and the lateral cutaneous femoral nerves are blocked (7). The block is a useful local anesthetic in surgery of the knee, thigh and hip because it can reduce the need for systemic analgesia during and after the operation. However, no prospective trials have been carried out to demonstrate this effect in total hip arthroplasty. In the present study, we compared the need for perioperative analgesia in two groups, one receiving general anesthesia and a supplemental 3-in-one block, the other general anesthesia only.

MATERIAL

One hundred and eighty-two patients selected for elective unilateral total hip arthroplasty were asked to participate in a prospective consecutive study. Informed consent was obtained from all patients. The study was approved by the research ethics board of the municipality of Soenderjylland, Ribe and Ringkoebing.

Eighty-nine patients were randomized to general anesthesia only, and 93 patients had both general anesthesia and a supplemental 3-in-one block.

Three patients were excluded from the investigation. One patient could not cooperate, and another patient had had a groin operation which made the femoral nerve impossible to locate. The last patient was excluded because of a hematoma in the groin after accidental puncture of the femoral artery.

METHODS

The block was done as described by Brands *et al.* (2). Nerve identification was performed using an electric nerve stimulator prior to induction of general anesthesia. After aspiration, 20 ml of bupivacaine (0.5%) and 20 ml lidocaine (2%) with epinephrine were injected.

Infiltration anesthesia of the lateral femoral cutaneous nerve was obtained by injecting 5 ml of lidocaine (1%)

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1 cm to 2 cm medial and distal to the anterior superior spine.

General anesthesia for all patients started with pancuronium bromide 0.01 mg/kg, fentanyl citrate 0,1 mg/kg, atropine 0.01 mg/kg, thiopental 4 mg/kg and suxamethonium chloride 1.2 mg/kg. A submaximal dose of pancuronium bromide of 3 to 4 mg was administered ; no supplemental doses were given.

Ventilation consisted of 66% N_2O and 34% O_2 and 0.6% enflurane from a circle system with 3 l of fresh gas.

Pulse rate, blood pressure, pupillary changes and possible movements were carefully observed during the operation, and we used supplemental doses of fentanyl citrate if there was an increase in blood pressure and/or pulse rate. The N_2O and O_2 were not changed.

The operation consisted of a cemented total hip arthroplasty using a posterior approach as described by Moore (3). The time from start of surgery to the end of surgery was noted.

The recovery ward staff was not informed of the patients allocation to either of the two groups. Additional analgesia on postoperative pain consisted of nicomorphine 0.1 mg and was given on request or if there was an increase in blood pressure and/or pulse rate.

The amount of nicomorphine during the first 24 hours was recorded.

STATISTICS

Statistical comparison was made using a non-parametric method (Mann-Whitney test). Differences were considered to be statistically significant when p-values were less than 0.05.

RESULTS

Age, sex, weight and length of effective anesthesia and operative time are shown in table I. The groups were not significantly different in any respect. The need for fentanyl citrate and nicomorphine in the two groups is shown in table II. Patients with a 3-in-one block required significantly less analgesics per- and postoperatively than did the patients who did not receive a 3-in-one block. No toxic reactions due to the local anesthetics were recorded.

Table I. — Age, weight, length of operation and anesthesia of the patients in each group (median and range)

	General anesthesia N = 89	General anesthesia and 3-in-one block N = 90
Man/woman (years)	43/46	42/51
Age	70 (53-88)	71 (48-85)
Weight (kg)	72 (47-106)	72 (39-106)
Length of anesthesia (minutes)	110 (75-210)	112 (76-200)
Length of operation (minutes)	80 (50-170)	80 (55-180)

Statistics Mann-Whitney : No difference between the two groups.

Table II. — Analgesics per- and postoperative in each group (mean and range)

	General anesthesia N = 89	General anesthesia and 3-in-one block N = 90
Fentanyl citrate peroperatively (mg)	0.36 (0.1-1.3)	0.28 (0.1-0.6)
Nicomorphine post-operatively (mg)	20 (0-46)	16 (0-51)

Statistics : Mann-Whitney
Peroperatively : p = 0.002 ; Postoperatively : p = 0.049.

DISCUSSION

The 3-in-one block is usually easy to perform, and with a nerve stimulator for nerve identification the course is uneventful (4). Only a few complications have been reported using a nerve stimulator (6).

The 3-in-one block effectively diminishes the per- and postoperative pain in patients with a fracture of the femoral neck (1). Others have obtained satisfactory pain alleviation by applying a "permanent" catheter in the femoral nerve sheath in patients with fractures of the hip (2, 5). Analgesia is also improved when a 3-in-one block is combined with infiltration anesthesia of the lateral femoral cutaneous nerve as compared with a 3-in-one block alone (4).

We found a lessened requirement for perioperative analgesics in patients who had a 3-in-one block supplemental to the general anesthesia.

The difference in analgesics is small and will presumably not show any clinical relevance in the patient with a healthy cardiovascular status.

We conclude that the 3-in-one block in combination with light general anesthesia is not the anesthetic of choice in total hip arthroplasty using the posterior approach.

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SAMENVATTING

B. UHRBRAND, T. TOFTGAARD JENSEN, D. KLITGAARD BENDIXEN en J. FLEMMING HARTMANN-ANDERSEN. Pre-operatieve analgesie door regionale blok bij totale heuparthroplastiek. Gerandomiseerde prospectieve blindstudie.

De auteurs hebben een gerandomiseerde prospectieve blindstudie gedaan bij 182 patiënten, geopereerd voor totale arthroplastiek van de heup ; de behoeften van de patiënten aan peri- en postoperatieve analgetica werden in 2 groepen verdeeld : in één groep was er een associatie van algemene anesthesie en regionale blok, in de andere groep uitsluitend een algemene anesthesie. Ofschoon er een vermindering in de behoeften van per- en postoperatieve analgetica gezien werd in de groep met de associatie van algemene anesthesie + regionale blok, was bij patiënten met een normale cardiovasculaire status het verschil niet klinisch relevant. De auteurs konkluderen dat de regionale blok, gecombineerd met een algemene anesthesie, niet de ideale anesthesietechniek is bij totale heuparthroplastiek langs de posteriore benadering.

RÉSUMÉ

B. UHRBRAND, T. TOFTGAARD JENSEN, D. KLITGAARD BENDIXEN et J. FLEMMING HARTMANN-ANDERSEN. Analgésie péri-opératoire pour arthroplastie totale de hanche par bloc régional. Étude prospective en double aveugle et randomisée.

Les auteurs ont procédé à une étude prospective, randomisée, en double aveugle de 182 malades, opérés d'arthroplastie totale de hanche ; les besoins des malades en analgésie péri- et postopératoire furent divisés en 2 groupes : un groupe avec anesthésie générale, associée à un bloc régional, le second recevant une anesthésie exclusivement générale.

Quoique les auteurs aient constaté une réduction des besoins analgésiques dans le groupe, associant l'anesthésie générale et le bloc loco-régional, la différence restait peu importante et sans signification clinique chez les malades, ne présentant pas de handicap cardiovasculaire. Les auteurs en concluent que l'association d'une anesthésie générale et d'un bloc régional dans l'arthroplastie totale de hanche, par voie postérieure, ne présente pas de bénéfice notable.