

Antibiotic prophylaxis in surgery for hip fractures

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Totally, 185 patients, operated on for a fresh hip fracture, were randomly allocated to either methicillin antibiotic prophylaxis or no prophylaxis and followed for 1 month. Two superficial wound infections were recorded in the prophylaxis group and one in the control group. Prophylactic use of antibiotics in surgery for hip fractures seems unnecessary provided strict aseptic routines in the operating room are followed.

The rate of postoperative wound infection after operation for hip fracture varies from 2 to 10 percent (Bowers et al. 1973). The effect of antibiotic prophylaxis has been evaluated in several investigations (Tachdjian and Compere 1957, Boyd et al. 1973, Tengve and Kjellander 1978), but the results are often difficult to compare, either because the studies are retrospective or because of lack of information about the precautions taken to inhibit exogenic contamination (Bergman 1978, Burman et al. 1979, Burnett et al. 1980). In recent publications on extracapsular femoral neck fractures, antibiotic prophylaxis has been shown to reduce wound infection rates from 15 percent to less than 5 percent (Boyd et al. 1973, Bowers et al. 1973, Laros 1975, Tengve and Kjellander et al. 1978).

We have compared antibiotic prophylaxis versus no antibiotics in patients undergoing operation for hip fractures where a strict regimen against exogenic contamination was followed.

Patients and methods

The study was performed as a prospective randomized trial. Two hundred consecutive patients with a hip fracture who were admitted to the surgical department at Sundby Hospital were studied. Excluded were patients with a history of allergy to penicillin, active infection requiring antibiotic therapy, decreased renal function, and patients subjected to arthroplasty.

On admission the patients were randomly allocated to a *control* group to whom no antibiotic prophylaxis was given and to a *treatment* group to whom 2 g methicillin was administered at the start of the operation. Thereafter, no antibiotics were given.

The operations were performed in a central operation theater, where all types of surgery are performed. However, a special room was reserved for fracture surgery, albeit with conventional ventilation, and several different surgeons performed the procedures during the study period.

In 142 patients with an extracapsular hip fracture (131 trochanteric and 11 subtrochanteric), either an AO Dynamic Hip Screw or a Richards sliding screw was used.

Forty-three patients with an intracapsular hip fracture, with no or minimal dislocation, were provided with three AO screws.

All the patients were operated on within 24 hours of admission to the hospital. The operations were carried out on a traction table with closed reduction

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and an image intensifier. All the wounds were drained postoperatively for 24 to 36 hours with a closed drainage system.

During the operation the door to the operating room was locked to reduce traffic. After reduction the skin was washed with 0.5 percent chlorhexidine, and covered with Steridrape®. After the operation the wound surroundings were washed with saline solution and 35 percent propanolium and dried. Thereafter, the wound was covered with Nobecutan® and sterile gauze bandages held by tape until the sutures were removed.

All the personnel wore a mask and cap covering all the hair. The surgeons wore one pair of gloves when draping the patient and a second supplementary pair during the operation.

The state of the wound was recorded on the 5th and 10th day after the operation, and finally by an independent observer 1 month postoperatively. A *wound abscess* was defined as an accumulation of pus draining spontaneously or after opening the wound.

Ten patients died (6 patients in the methicillin group and 4 patients in the control group), and 5 patients went out of the study because of procedural slips (3 patients with ongoing preoperative antibiotic treatment, 1 patient with allergy to penicillin, and 1 patient for whom another antibiotic was chosen); this left 93 patients in the methicillin group (75 females and 18 men) with a median age of 82 (40-101) years and 92 patients in the control group (67 females and 25 men) with a median age of 78 (41-104) years. The two groups were similar with regard to intracapsular versus extracapsular hip fractures, and concerning the time from hospital admission to operation.

Results

At follow-up 1 month after surgery, 1 patient had had a sterile hematoma evacuated, and 3 patients had a superficial wound infection (1 trochanteric and 1 subtrochanteric fracture in the methicillin group and 1 trochanteric fracture in the control group). The difference was not significant. No deep abscess was observed during the study period. Bacteria recovery in the three superficial wound infections were *Staphylococcus aureus* in 1 patient, *Corynebacterium* species group D2 in the second patient, while no bacteria were isolated in the third patient.

Discussion

Recent studies have shown that the major source of wound contamination is intraoperative airborne vectors and that especially traffic in the operating rooms leads to contamination (Wright 1973, Bergman 1978, Burman et al. 1979).

In our study, no value of antibiotic prophylaxis could be demonstrated. The good results in the control group regarding wound sepsis rate may be explained by a strict aseptic regimen against exogenous contamination.

For several reasons, it is important to reduce the consumption of antibiotics, which may create a false sense of security, may promote growth of drug-resistant bacterial strains, can cause allergic and toxic side effects, may be instituted to make up for technical laxity and carelessness, and, finally, are expensive (Bowers et al. 1973, Burnett et al. 1980).

We conclude that the prophylactic use of antibiotics in hip fracture operations is unnecessary when strict routines provide an aseptic operating environment.

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