

# Increased blood loss after preoperative NSAID

## Retrospective study of 186 hip arthroplasties

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We have evaluated bleeding during and after hip replacement in 186 patients in relation to preoperative intake of nonsteroidal anti-inflammatory drugs

(NSAID) combined with low molecular weight heparin. NSAID was associated with increased peroperative bleeding and blood transfusion requirements.

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Submitted 92-09-19. Accepted 93-04-01

Acetylsalicylic acid (ASA) and other nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used as analgesics, anti-inflammatory agents, and as prophylaxis against heterotopic bone formation after total hip replacement (Schmidt et al. 1988, Freiberg et al. 1991, Pagnani et al. 1991). Perioperative regimens often include prophylactic heparin, also associated with an increased risk of bleeding (Verstraete 1990). Therefore, there has been concern that the combined use of NSAID and anticoagulants might increase the perioperative risk of bleeding complications (Reasbeck et al. 1982, Engel et al. 1989).

We evaluated the bleeding risk of preoperative NSAID therapy combined with low molecular weight heparin administered as thrombosis prophylaxis during and after total hip replacement.

### Patients and methods

In the period from January 1990 through March 1991 263 total hip replacements were performed in 252 patients at our hospital. Thromboprophylaxis was started in all the patients the evening before the operation with 20 mg enoxaparin (Klexane®) subcutaneously. Subsequently a daily dose of 40 mg enoxaparin was given until the patient was mobilized. Age, sex, weight, height, previous diseases and medications, duration of the operation and the type of anesthesia were recorded in the hospital file.

A posterolateral incision without trochanteric osteotomy was used in all operations. Bleeding during the operation was estimated and quantitated by the anesthetic staff and, in addition, the daily loss of drainage blood was noted in the patient's chart. Prescription of

blood transfusion after the operation was based on judgement by the surgeons and noted.

Only patients who underwent a primary hip operation were included and those, who received long-term anticoagulant or steroid treatment, were excluded. 66 patients were for these reasons not included, leaving 186 patients for evaluation. 83 patients had a regular intake of NSAID up to the day of operation and 103 either did not use analgesics or they used acetaminophen or opioid analgesics only (Table 1). The patients in these 2 groups were comparable with respect to sex distribution, age, height, weight, duration of the operation and type of anesthesia.

Mann-Whitney's rank sum test was used for statistical analysis of bleeding and transfusion. A Student's *t*-test was used to compare the patients' data.

### Results

The NSAID patients had a higher peroperative blood loss, whereas no difference was seen in postoperative blood loss (Table 2). The NSAID group also used more blood transfusions. There were 5 patients in the non-NSAID group and 10 taking preoperative NSAID who had a peroperative bleeding above 1500 mL. When they were excluded from the calculation, the differences were still obtained (*P* 0.01 and 0.02, respectively).

The number of patients receiving only acetaminophen or opioid derivative analgesics is too small to draw conclusions about influence on bleeding if any, but the group did not differ from those without analgesic intake (*P* 0.4).

Deep vein thrombosis (DVT) and pulmonary embolism were not objectively investigated in this study,

Table 1. Distribution of preoperative analgesics in the 2 patient groups (SD)

	NSAID medication			
	No		Yes	
Number of patients	103		83	
ASA	0		11	
Other NSAIDs	0		59	
ASA and other NSAIDs	0		13	
Acetaminophen	11		10	
Opioid derivatives	8		3	
Age	66	11	64	13
Height, cm	161	29	156	41
Weight, kg	71	17	70	19
Female/male	62/41		49/34	
Epidural/general anesthesia	22/81		27/56	
Operation time, min	115	26	125	30

NSAID Nonsteroidal anti-inflammatory drugs  
ASA Acetylsalicylic acid

but only 3 had clinical signs of DVT verified by phlebography and no deaths occurred during the hospitalization.

## Discussion

The methodology of our study does not exclude the possibility of bias. The exact dose of the NSAID consumed by the patients before admission to the hospital cannot be accurately obtained in a retrospective study, and, except for ASA, we did not distinguish between different types of NSAID. Registration of bleeding during operation is not accurate and prescription of blood transfusion is based on the subjective judgement of different surgeons. Nevertheless, a clear increase in bleeding tendency could be demonstrated in elective hip replacement patients receiving preoperative NSAID treatment and thrombosis prophylaxis with low molecular weight heparin.

Only a few studies have been performed calculating the potential bleeding risk, and they have all focused on the administration of NSAID during hospitalization. Postoperative therapy with indomethacin in patients receiving perioperative thrombosis prophylaxis with low-dose heparin-dihydroergotamine in relation to total hip replacement induced only marginally increased postoperative bleeding into drains (Kristensen et al. 1990). In a randomized study, where an indomethacin infusion was started prior to an emergency operation of the lower extremities, the mean bleeding time was prolonged (Taivainen et al. 1989); at the end of the 20-hour infusion marginally more patients bled through their bandages. None of the

Table 2. Perioperative and postoperative blood loss (mL) and number of required transfusions in relation to preoperative treatment with nonsteroidal anti-inflammatory drugs (NSAID)

	NSAID medication	
	No	Yes
Number of patients	103	83
Perop blood loss, mean	731	932*
Median and range	600 (35-1800)	800 (150-3200)
Postoperative blood loss	574	568
	510 (75-1905)	480 (75-1750)
Number of transfusions	1.7	2.9**
	2 (0-6)	2 (0-16)

\*  $P < 0.003$ , \*\*  $P < 0.004$ .

patients received thrombosis prophylaxis. In a placebo-controlled study in patients undergoing hysterectomy, Engel et al. (1989) found a higher incidence of hemorrhagic complications and perioperative blood loss in the group of patients starting treatment with indomethacin prior to the anesthesia. No thrombosis prophylaxis was used. Pre- and perioperative low-dose ASA treatment was found to increase the risk of bleeding complications and reoperation during coronary artery bypass surgery (Goldman et al. 1989).

On the basis of our study we suggest a simple precaution. NSAID should be replaced by acetaminophen, and arterial thrombosis prophylaxis with ASA should be withdrawn 1 week prior to a hip replacement operation.

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