POSTOPERATIVE TREATMENT WITH NSAID'S INCREASES THE RISK OF REVISION AFTER NONCEMENTED TOTAL HIP ARTRHOPLASTY

*Kjaersgaard-Andersen, P; **Johnsen, SP; **Riis, A; ***Lucht, U; ****Overgaard, S;*****Jensen, K.
*Vejle Hospital, University of South Denmark; **Department of Epidemiology, University of Aarhus; ***Aarhus Hospital, University of Aarhus;
****Odense Hospital, University of South Denmark;*****Pfizer Denmark. E-mail: pka@dadlnet.dk

INTRODUCTION:

Orthopaedic surgeons frequently prescribe nonsteroid antiinflammatory drugs (NSAIDs) in the early postoperative period after total hip arthroplasty (THA) for prevention of heterotopic ossification[1] (HO) or for pain treatment. During the last decade it has been debated whether NSAIDs does influence bone healing when used in skeletal surgery[2] – thereby possibly prevent bony ingrowth into non-cemented implants, increasing the risk for aseptic loosening. This fearing is mainly related to observations made in animal studies, where NSAIDs have been shown to reduce bony ingrowth into non-cemented implants[3], weakened healing of fractures[4] and reducing the quality of bone in experimental spinal fusion[5]. Moreover, studies of cell-cultures have found NSAIDs to inhibit osteoblasts[6].
However, at present no clinical studies have shown that NSAIDS increases the risk for aseptic loosening after non-cemented THA. More studies have analyzed the risk through earlier clinical studies where NSAID has been given in prevention of HO – but none have shown a significant difference between the treated and non-treated groups[7,8].

METHODS:

Since 1995 the Danish Hip Arthroplasty Register (DHR) has recorded patients undergoing THA including any treatment with NSAID in the early postoperative period in prevention of HO. During 1995 to 2003 total 43.166 THA's have been reported to DHR, 23.337 cemented, 7.765 noncemented and 12.064 hybrids. During this period total 7.185 cases have been treated with NSAIDs for 5 days or more in the early postoperative period.
A record was made for each clinic reporting hip arthroplasties to the register. Total 52 clinics reported to DHR – 47 governmental hospitals and 5 private hospitals. Clinics reporting less than total 20 cases – respectively less than 3% of all operated hips – being treated with NSAIDs during the period 1995-2003, were excluded from the study. The reason for this exclusion was to eliminate an eventual miss-positioned cross on the DHR report.
All clinics were asked to give information to what type of NSAIDs they used, the dosage, at what time the first dosage were given and to the duration of the treatment.
Multivariate Cox Regressions Analysis was used to estimate the relative risk (RR) for aseptic loosening if treated with NSAIDs and adjusted for possible confounding factors including sex, age, side of operation, indication for surgery and type of fixation of the implants.

RESULTS:

Using the above mentioned exclusion criterion, 196 hips from 30 clinics were excluded from the study – leaving total 6.989 cases treated with NSAIDs in the early postoperative period in 22 clinics to be investigated. Cases from the 30 clinics reported not to be treated with NSAIDs were included in the analysis.

The used NSAIDs varied between clinics - as shown below:

Ibuprofen	7 clinics
Indomethacin	4 clinics
Diclofenac	4 clinics
Vioxx	4 clinics
Tilcortil	1 clinic
Different drugs	2 clinics

The duration of treatment varied – as shown below:

5-6 days	3 clinics
7-8 days	6 clinics
9-13 days	4 clinics
14 days	5 clinics
21 days	3 clinics
28 days	1 clinic

In patients with noncemented THA, NSAIDs were associated with a significantly increased risk for revision due to aseptic loosening (RR=3.09; 95% CL: 1.36-7.01). In contrast, in patients with cemented THA, NSAIDs were associated with a reduced risk for revision due to aseptic loosening (RR=0.76; 95% CL: 0.55-1.04).

DISCUSSION:

This study is the first to document that NSAIDs increases the risk for revision of noncemented THA due to aseptic loosening. Surprisingly, NSAIDs appeared to "protect" cemented THA from aseptic loosening. The reason for this difference could be the fact that after inserting a cemented implant – a sclerotic area of dead bone is established close to the cement. This bone is normally removed by osteoclasts. However, as they are inhibited by NSAIDs – no resorption takes place. Hereby, the dead bone simply act as scabelon for the cement – as seen in impact grafting. In contrast, non-cemented implants need ingrowth to be well fixed. As osteoblasts are inhibited by NSAIDs – this may be the explanation.

As the results in this study is based on observations from a register – and therefore may have its limitations.

CONCLUSIONS:

1. Treatment with NSAIDs in the early postoperative period after non-cemented THA increases the risk of being revised due to aseptic loosening. Therefore, treatment with NSAIDs should be avoided if using a non-cemented implant.
2. In contrast, treatment with NSAIDs in the early postoperative period after cemented THA seems to reduce the risk of being revised.
3. If postoperative treatment with NSAIDs is mandatory (prevention of HO; part of pain-treatment or for ptt's with Rheumatoid Arthritis) a cemented hip arthroplasty is recommended.

REFERENCES:

1. Kjaersgaard-Andersen P, et al. J Bone Joint Surg 73A::942-7, 1991.
2. Kjaersgaard-Andersen P, et al. Acta Orthop Scand 74(2):230-1, 2003.
3. Trancik T, et al. Clin Orthop 249:113-21, 1989.
4. Gerstenfeld LC, et al. Expert Opin Drug Saf 3(2):131-6, 2004.
5. Dimar JR, et al. Spine 21(16):1870-6, 1996.
6. Evans CE, et al. J Bone Joint Surg 86B:444-9, 2004
7. Wurnig C, et al. Clin Orthop 361:150-8, 1999.
8. Trnka HJ, et al. Arch Orthop Traum Surg 119:456-60, 1999.

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