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30-Day Mortality following elective Hip and Knee Replacement

Śmiertelność w okresie 30 dni po planowych zabiegach całkowitej endoprotezoplastyki stawu biodrowego i kolanowego

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Słowa kluczowe:
THR-Total Hip Replacement
TKR-Total Knee Relacement
mortality
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Survey 30 day mortality following elective major joint replacement. We present 12-year (March 1996-March 2008) retrospective analysis of data. We wanted to compare 3 periods data (Mar 1996-Feb 2000, Mar 2000-Feb 2004, Mar 2004-Feb 2008) and causes of death. Patients (n=4760) scheduled for elective Total Hip Replacement and Total Knee Replacement. We identified 30-Day mortality and causes of death. Mortality and causes of death in 12 years changed. 30-Day Mortality following Total Hip Replacement 0.31-0.84%-0.46%, following Total Knee replacement 0.49%-0.42%-0.21%. Causes of death between 1996 and 2008 changed – we observed more pulmonary emboli causes of death between 2000 and 2004. Miscoding problems. 30-Day mortality following Total Knee Replacement changed from 0.49% to 0.21%. We had no proven fatal pulmonary emboli in Total Knee replacement last 12 years. All-cause mortality of Total Knee replacement possibly improved with regional anaesthesia.

Praca dotyczy śmiertelności w pierwszych 30 dniach po planowych zabiegach operacyjnych wymiany stawu biodrowego i kolanowego. Retrospektywna analiza danych porównuje 3 okresy po 4 lata od marca 1996 do marca 2008. W tym czasie wykonano 4760 w/w zabiegów. Śmiertelność związana z operacjami wahała się w tych okresach odpowiednio 0,31%-0,84%-0,46% w przypadku wymiany stawu biodrowego oraz 0,49%-0,42%-0,21% w przypadku wymiany stawu kolanowego. W okresie 12 lat zmieniły się bezpośrednie przyczyny zgonów, obserwowaliśmy mniej zatorów tętnicy płucnej. Przypuszczamy, że wiąże się to częstszym stosowaniem regionalnej anestezji przy zabiegach wymian stawu biodrowego i kolanowego.

Introduction

Every year more and more major joint replacement is performed. There are many causes connected to, like eg. agening of population, economic development, more communication accidents or growing popularity in playing sport in developed countries. It is estimated that by the year 2030, 17% of the population in the United States will be older than 65 years [1]. Probably, over half of this population will require surgical intervention, where orthopedic procedures are most common. No longer is a patient's age contraindication to anaesthesia and surgery. Nowadays, healthy style of life is associated with doing sports, but this unfortunately may lead to many injuries. Sometimes extreme sports are taken up by people without any previous experience.

The mortality at 30-days following major joint replacement was highest for the simultaneous procedure group (0.99%) versus staged 3 or 6 months (0.3%) [2]. We compared the 3 periods between 1996-2008, the causes of death. The first 2 periods were compared in 2004 (1996-2004) and showed unexpected increase of pulmonary emboli causes of death. Most important for us was to analyse another 4-year period to examine the causes of death and compare them to previously performed study.

Methods

We identified:

3 periods: Mar 1996-Feb 2000, Mar 2000-Feb 2004, Mar 2004- Feb 2008 30-day mortality causes of death.

In 12 years we anaesthetised 4760 patients for elective total hip replcement and total knee replacement. We performed general anaesthesia and spinal single shot anaesthesia. We also did peripheral nerve blocks for the lower extremity like femoral nerve block, sciatic nerve block and psoas block. The patients following general anaesthesia usually had patient control analgesia to self-control pain post operation. The patients undergoing anaesthesia were classified as ASA II and ASA III. The 30-day mortality we

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analysed checking the hospital documents and the causes of death were based on post mortem research.

Results

Between 1996-2008 there were 2728 patients following total hip replacement and 2032 patients following total knee replacement. In total hip replacement group there were 14 cases of death (0.51%), in total knee replacement group 7 cases of death (0.34%). Unfortunatly we had 4 miscoded cases in total hip replacement group and 2 miscoded cases in total knee replacement group.

In the first analysed period 1996-2008 there were 940 patients following total hip replacement, 3 patients died (0.31%). On the first day post operation 2 patients died, the cause of one death was left ventricular failure, the other one was unknown. The third patient died on day 7 post operation because of myocardial infarct. There were no miscoded cases. In the second period 2000-2004 there were 710 patients following total hip replacement, 6 patients died (0.84%). On day 4 two patients died, one of them had fatal pulmonary emboli, another one myocardial infarct. Other 3 patients died because of fatal pulmonary emboli on day 6,14 and 17. The other cause of death in this group was septicemia. There were 3 miscoded cases. In the third period 2004-2008 there were 1078 following total hip replacement, 5 patients died (0.46%). The cause of death in the theatre was left ventricular failure (sudden cardiac event 3 minutes after femoral cement, acute hypotension -no response to resuscitation). The other 3 patients died because of myocardial infarct on day 2, 3 and 4 post operation. One cause of death was fatal pulmonary emboli on day 3 post operation. Another cause of death was unknown, patient was discharged home on day 6, died on day 18 post operation.

Total hip replacement results summary showed better than NHSIA estimate between 1996-2000 and worrying cluster of pulmonary emboli between 2000-2004. In the third period we had fewer incidents of pulmonary emboli death.

Between 1996-2000 there were 403 patients following total knee replacement, 2 patients died (0.49%). There was 1 miscoded case. One cause of death was unknown on day 2, the other one was left ventricular failure on day 13. In the second period 2000-2004 there were 704 patients following total knee replacement, 3 patients died because of myocardial infarct on day 13, left ventricular failure on day 20 and intracranial haemorrhage on day 25. There was no miscoded cases. In the third period 2004-2008 there were 925 patients following total knee replacement, 2 died. The first cause of death was myocardial infarct on day 3, the second cause of death was bronchopneumonia on day 25 post operation. We had no fatal pulmonary emboli in total knee replacement in last 12 years.

Discussion

TKA results summary showed according to NHSIA the same factors known to increase mortality like: age>80, preexisting cardiopulmonary disease and cement. Unfortunately the increase of fatal pulmonary emboli post total hip replacement in years 2000-2004 was observed. We observed a decrease of fatal pulmonary emboli between 2004-2008 compared to 2000-2004 (1 case versus 4).

All-cause mortality of total knee replacement possibly improved with regional anaesthesia and absence of bilateral procedures. Unfortunately we did not compare anaesthetic procedures between 1996-2004, but in the 2004-2008 period we analysed the kind of anaesthesia. There were 7 deaths following total hip replacement and total knee replacement. There were 5 general anaesthesia and 2 spinal single shot anaesthesia for those cases. We think that regional anaesthesia compared to general anaesthesia has multiple benefits. In total hip anaesthesia intraoperative blood loss is reduced, especially in eldery patients [3]. It is probably linked to reduction in the central venous pressure. Postoperative blood loss is the same and does not seem to depend on the anaesthetic technique. Spinal anaesthesia can suppress partialy or completly the neuroendocrine stress response to major joint replacements [4]. The benefits of spinal anaesthesia are also lower incidence of respiratory complications, pulmonary emboli and deep vein thrombosis. The increase of blood flow in lower extremities due to sympathectomy and effect of local anaesthetics on endothelium are responsible for reduced incidence of deep vein thrombosis following spinal anaesthesia [5]. A meta-analysis of randomized trials published in BJA in 2000 showed that regional anaesthesia for total hip replacement was associated with reduced mortality rate at 1-month in comparision to general anaesthesia [6].

Unfortunately we had some miscoded cases.

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