

AN ANALYSIS OF PRACTICE VARIATIONS CONCERNING THE ARTHROPLASTY OF HIP IN OLD PATIENTS, USING ADMINISTRATIVE AND CLINICAL DATA FROM HOSPITALS

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Keywords: arthroplasty, elderly, practice variations, hospitals

Abstract: Background: The evaluation of practice variations is necessary for hospital performance improvement, cost containment and better care, in Romania, as well as in other countries. Methods: This is an observational descriptive retrospective study; patient level clinical data for 60 years old and over patients from nationwide acute care and per cases financed hospitals were used; the following were analyzed: socio-demographic features, volume of hospital services, average length of stay, diagnoses for patients with a principal surgical procedure having the block code 1489, arthroplasty of hip. Results: Arthroplasty of hip for inpatients, 60 years old and over represents 70% of all arthroplasty procedures for all age groups. The percentage of arthroplasty of hip from the total number of principal surgical procedures varies in 2008 with the district of the hospital between 0, 08% and 4,95%, and the average length of stay between 11, 1 and 29 days. Arthroplasty of hip was almost two times more frequent in women than in men. Only 12 districts reported more than 100 cases in this period. Conclusions: Romania has a lower rate of arthroplasty of hip, in comparison with international data and a higher length of stay. Practice variations are widespread on national territory; possible explanations could be the higher availability of resources in large hospitals, or the appropriate expertise in surgeons from these hospitals. Further analysis should focus on performance (complications, mortality rates) in hospitals from districts with 100 or less such procedures yearly.

Cuvinte cheie: artroplastie, vârstnici, variații de practică, spitale

Rezumat: Context: Evaluarea variațiilor de practică este necesară pentru îmbunătățirea performanței spitalelor, controlul costurilor și îmbunătățirea calității îngrijirii, în România la ca și în alte țări. Metodologie: S-a realizat un studiu observațional descriptiv cu abordare retrospectivă, utilizând datele clinice la nivel de pacient din secțiile de acuți ale spitalelor finanțate ca "tarif pe caz rezolvat" la nivel național, pentru pacienții în vârstă de 60 de ani și peste. Am analizat caracteristicile socio demografice, volumul serviciilor spitalicești, durata medie de spitalizare, diagnosticile pentru pacienții care au suferit o intervenție chirurgicală principală cu cod de bloc 1489, artroplastia șoldului. Rezultate: Artroplastia șoldului pentru pacienții de 60 de ani și peste reprezintă 70% din procedurile de artroplastie efectuate pentru această grupă de vârstă. Proporția artroplastiei șoldului din numărul total de intervenții chirurgicale principale efectuate a variat în 2007 în funcție de județul spitalului între 0, 08% și 4,95%, iar durata medie de spitalizare (DMS) între 11, 1 și 29 zile. Artroplastia șoldului a fost aproape de două ori mai frecventă la femei față de bărbați. Doar 12 județe au raportat mai mult de 100 de cazuri în această perioadă. Concluzii: România are o rată mai scăzută de artroplastie de șold, în comparație cu datele internaționale și o durată medie de spitalizare mai mare. Variațiile de practică sunt răspândite pe teritoriul național, explicații posibile putând fi mai marea disponibilitate a resurselor din spitalele mari, sau experiența profesională adecvată a chirurgilor din aceste spitale. O analiză ulterioară ar trebui să se concentreze asupra performanței (complicații, rate de mortalitate), în spitale din raioanele cu 100 sau mai puțin astfel de proceduri anual

INTRODUCTION

Initiated in USA more than thirty years ago, the evaluation and measurement of medical practice variations became a priority as well for the European countries. Variations are inevitable and quite normal in practice, but their excessive volume could lead to unjustified increase in the consumption of health resources and, in the end, they prejudice the very health status of the patient.

After Wennberg, the variations are unwarranted because they cannot be explained by type or severity of illness or by patient preferences.(1,2) A great number of studies have shown that a higher frequency of health services use from patients does not improve health outcomes. Small area

variations (SAV) are the large differences in the rates of use of medical services between geographic regions, in comparisons of countries, provinces and counties.(3)

A NHS report in 2000 stated that, for ensuring good outcomes, surgeons should perform more than 10 primary hip replacement or revision a year; also, the average length of stay should be reduced in NHS hospitals from 11 days to 6 days, and this was expected to save £15,5 to £46,5 million each year. (4) Medicare analysis indicates that in hospitals with more than 100 hip replacement/year the risk of death or complications is lower than in hospitals with 10 procedures or fewer/year. The average length of stay nationwide for this procedure was 5, 2, and the mortality for the total or partial hip replacement was 1,

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13% according to Agency for Healthcare Research and Quality (2001).

PURPOSE OF THE STUDY

The scope of the present study is to analyze the medical approach of hip arthroplasty in old patients from Romanian hospitals, as well as to evaluate the practice variations in different geographic areas, during the period 2005-2008.

MATERIAL AND METHOD

The study design is an observational descriptive study, with retrospective perspective, based on implementation, in 2003, of patient level clinical data compulsory collection (in electronic format), for all Romanian hospitals.(5) The national database managed for administrative purposes and for medical activity evaluation was used. All records for inpatients of 60 years old and over, discharged in 2005-2008, reported by acute care departments and per case financed hospitals were selected from this national database and included in the study, regardless the specialty of the hospital or the ward. A more refined analysis was performed for 2008.

Were excluded from the study all patients who have met one or more criteria concerning unsatisfactory data quality, uninsured persons or with errors DRG assignment.

The analysis concerned the type of principal surgical procedure performed on these inpatients, considering the block code of the procedure. In particular, were studied cases that underwent a surgical procedure from block code 1489, arthroplasty of hip.

For diagnosis codes, between 2005-1st July 2007, hospitals used the International Classification of Diseases (ICD) 10 WHO 10th edition. Starting with July 2007 the list was replaced with ICD 10AM third version. For procedures, ICD 10 AM procedure codes list is used (Australian Classification of Health Interventions -ACHII).

We analyzed: the socio-demographic features of aged patient with arthroplasty of hip, the volume of hospital services, the average length of stay, the status at discharge, the pathology. From these perspectives were identified and analyzed the medical practice variations, in different geographic regions (districts) and comparative with the national level, for the selected period of time. Microsoft Excel, EpiMap 2000 and SPSS ver.14.0 were used for data analysis and

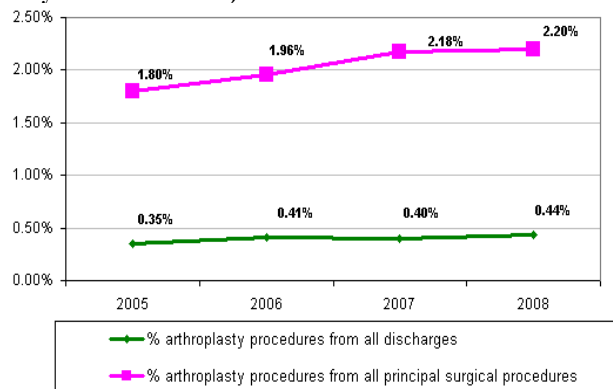
RESULTS

In Romania, 20% of population is 60 years old and over, and consumes 30% from inpatient cases and hospitalization days. Every year, on 20% from these inpatients one principal surgical procedure is performed; arthroplasty of hip is one of the most frequent procedures.

The number of cases with arthroplasty of hip varied between 4400 and 5914 cases during the period subjected to the study, or 1,80% to 2,18% from all principal surgical procedures reported for these inpatients (picture no. 1). Arthroplasty of hip for inpatients over 60 represents for all studied years 70% of all arthroplasty procedures performed for all age groups. During the period 01/01-09/30/2008, 4491 cases underwent an arthroplasty of hip, out of 957555 aged inpatients at national level. During this period, 226 hospitals discharged old patients, and around 20% of them underwent a principal surgical procedure. But only in 61 hospitals arthroplasty of hip as principal procedure was performed on aged patients. The average rate of arthroplasty of hip in old inpatients had an ascendant evolution, rising from 0,35 per 100 cases in 2005 to 0,44% in 2008 (estimated at 12/31/2008). This procedure accounts during the

studied period to 1,80% - 2,18% from all principal procedures performed on aged patients.

Picture no. 1. Evolution of the frequency of hip arthroplasty for cases discharged, 01/01/2005-09/30/2008, Romania (age 60 years old and over)

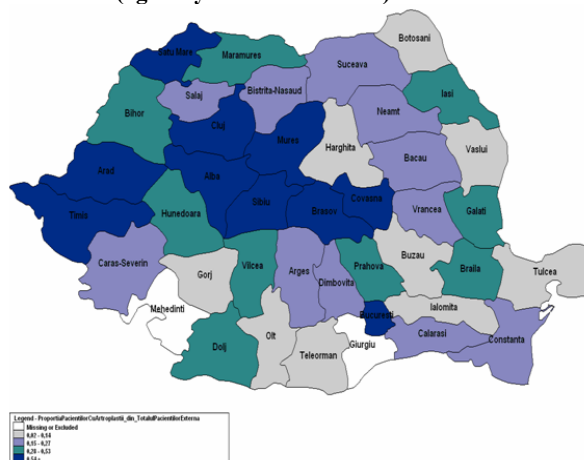


The comparison in geographic profile shows notable variations in the number of cases and average length of stay (ALOS). The percentage of arthroplasty of hip from the total number of principal surgical procedures varies in the studied period from the year 2008 between 0,08% (Buzău) and 4,95% (Mureș), and the ALOS between 11,1 (Buzău) and 29 days (Iași).

According to the residence of the patient, in rural areas the rate of arthroplasty of hip in old population was 113/100 000 inhabitants, but in urban areas, the rate was much higher: 175/100 000, with an average of 140/100 000 inhabitants. Nationwide, over 50% from these patients are from urban areas. Large differences in the type of residence (rural or urban) have been found in cases distribution after to the district of hospital- for example, 7,7% urban - Sălaj and 91% urban - Argeș, comparing with a national average of 55% patients from urban areas.

Also, in old patients, at national level, arthroplasty of hip was almost two times more frequent in women than in men.

Picture no. 2. Geographic variations for arthroplasty of hip procedure, as percentage of all discharges, Romania, 01/01-09/30/2008 (age 60 years old and over).

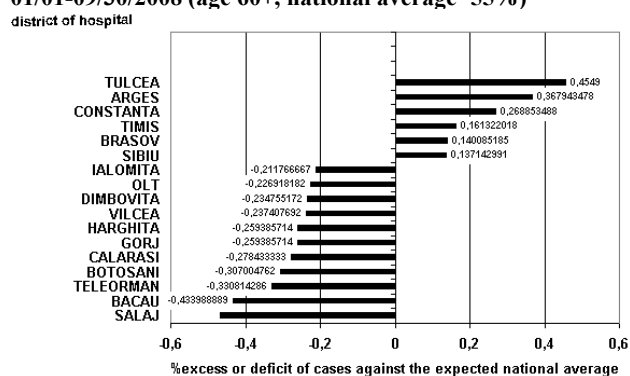


Districts from the centre of the country, and Bucharest as well, are situated in the first quartile according to the frequency of the arthroplasty of hip, as percentage from total principal surgical procedures performed to old patients as well as rate to all discharges for this category of inpatients. Five of the districts reported under 10 cases in 9 months 2008 (Tulcea,

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Buzău, Ialomița, Gorj, Harghita). In fact, only 12 districts reported more than 100 cases in this period (Galati, Sibiu, Arad, Iasi, Dolj, Alba, Prahova, Brasov, Timis, Cluj, Mures, Bucuresti) (pictures 2 and 4.) Sex distribution varies with the district of hospital. Comparing to a national mean of 66% women, Dambovită reported almost 83% of arthroplasty of hip in women, and Salaj 46%.

Picture no. 3. Variation in case distribution after the type of residence, considering the district of the hospital, Romania, 01/01-09/30/2008 (age 60+, national average=55%)



Districts with high number of procedures have lower ALOS then other districts (10-14, 5 days), the nationwide average being of 15, 52 days during the first 9 months of the year 2008. The highest ALOS was in Tulcea (29 days, but only one case), and Buzău (29 days), and the lowest was 10, 86 in Iasi. The two main principal disorders which made necessary the arthroplasty of the hip were arthrosis and injuries of thigh and hip (about 50% each)

Picture no. 4. Geographic variations for the average length of stay (ALOS) for cases with arthroplasty of hip, Romania, 01/01-09/30/2008 (age 60 years old and over)



An additional hypothesis from international literature, also tested in this study, stated that the type of the hospital can influence the existence of medical practice variations. We have chosen to classify all hospitals who reported cases in four main classes, according to the type:

- clinical hospitals – class 1
- district hospitals – class 2
- city hospitals – class 3
- single speciality hospitals – class 4 (only one hospital, not included in statistics)

The comparison of the mean (ANOVA) shows that there are statistics significant differences between the three classes of hospitals. There is a close indirect correlation ($r = -$

0.623) between the number of cases and the type of the clinical hospitals with more patients with hip arthroplasty than the district and city hospitals. (p value < 0.05)

DISCUSSIONS

Although at national level the frequency of arthroplasty of hip at old patient has a slight ascending tendency from the year 2005, there are large differences between districts from the point of view of the number of cases and the average length of stay. Geographic variations exist, according to the type of residence or the sex of inpatients.

Most often women and persons from urban areas underwent an arthroplasty of hip, probably in connection with the limited exercise and high frequency of osteoporosis. Most of the inpatients had no more than two hospitalisation episodes in the first 9 months from the year 2008, usually in the same hospital, and the mortality was very low.

As the frequency of cases depends on the type of the hospital, possible explanations could rely on the higher availability of resources in large hospitals, as well as the existence of the appropriate qualification and expertise in surgeons from these hospitals.

In comparison with the international experience, Romania has a much lower rate of arthroplasty of hip in general, with a much higher length of stay, and easily can be noticed that this type of procedure is more common in the centre of the country and districts with university centres.

From the international experience we learned that variations in the hospital services provided for hip arthroplasty are costly and dangerous,⁽⁶⁾ and the main concerns of health systems are focused on the reduction of length of stay and decreasing in postoperative complications. This could be done by ensuring adequate expertise of the surgeon (large number of cases, certifications from professional boards) and hospitals, as well as through implementation of clinical protocols and pathways for these patients.

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