are a major health problem among inner-city minority women. Although injuries were an important problem for all women, young women were disproportionately affected. Violence was the leading cause of injury morbidity and mortality, and rates of violent injury increased dramatically during the 4-year study period. Although the public health community has become increasingly concerned about violence against children and elderly people, few systematic efforts have been directed toward understanding violence against young, inner-city women. More work is urgently needed to elucidate the nature of violence against this population. □

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Total Hip Arthroplasty: Use and Select Complications in the US Medicare Population

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ABSTRACT

Use and outcomes of primary total hip arthroplasty among US Medicare recipients more than 65 years of age were investigated by means of physician and hospital claims for a 5% random sample during 1986 through 1989. Cases involving hip fracture or evidence of existing orthopedic devices in the hip were omitted. Use rates were higher for women than for men and were substantially lower for Blacks than Whites. Major complications (death, further hip surgery, infection, pulmonary embolism) were uncommon. These data document the frequent use of total hip arthroplasty, and confirm the rarity of serious adverse outcomes. Further studies should investigate the lower use of total hip arthroplasty among Blacks. (*Am J Public Health.* 1996;86:70–72)

Introduction

Although total hip arthroplasty is commonly performed,[1–3] description of its use and outcomes in the United States is incomplete. Most information regarding major outcomes is derived from (potentially unrepresentative) referral centers,[4–6] and national analyses regarding use or outcomes have been limited to hospital discharge data.[7–10] To further characterize primary total hip arthroplasty, we present analyses of its use and major outcomes in persons more than 65 years of age residing in the United States.

Methods

The analysis used a 5% sample of the US Medicare population during July 1, 1986, to June 30, 1989. To ensure detailed data, we included only individuals more than 65 years of age from the 50 states who had hospital and physician coverage, were not enrolled in health maintenance organizations, and were not receiving Medicare through Railroad Board entitle-

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This paper was accepted July 31, 1995.

ment. (This population represents over 90% of Medicare recipients more than 65 years of age.) Candidate patients had total hip arthroplasty coded on at least one hospital or physician claim (codes are available on request). Candidates with a single physician claim but no hospital claim were excluded, as were those in which the majority of coded procedures indicated hemiarthroplasty. We excluded candidates with evidence of hip or femur fractures, hip infection as the principal diagnosis, cancer diagnosis in the previous 6 months, or evidence of orthopedic devices present in the hip (codes are available on request). Joint pathology was taken from the discharge diagnoses for the admission for total hip arthroplasty.

Within demographic categories, rates were computed by dividing the number of cases by the sum of the December 31 populations for 1986 through 1988, obtained from Medicare enrollment files. Rate ratios (RRs) were computed by Poisson regression.[11]

We studied death, further hip surgery, prosthetic joint infection, and pulmonary embolism after total hip arthroplasty, using Medicare claims numbers to link claims to individuals and Medicare enrollment files to ascertain vital status. Identification of pulmonary embolism has been previously described and validated[12]; codes used to identify other end points are available on request. Life table methods[11] were used to estimate the risks of these complications; events that had occurred by September 30, 1990, were included. Death censored follow-up for all clinical end points, and revision surgery censored infection and pulmonary embolism. As a means of comparing survival of primary total hip arthroplasty patients and the general Medicare population, a random sample of Medicare enrollees was selected and matched to the case cohort on age, gender, and race. Survival comparisons were made with log-rank tests and Cox regression.[11]

Results

Of 11 706 candidate cases, 5579 met our definition of "primary" total hip arthroplasty performed in the absence of infection, fracture, or previous hip surgery. About 8% of this final group was identified exclusively through physician claims. Most patients (83.3%) had osteoarthritis coded; many fewer had rheumatoid arthritis (3.4%), aseptic necrosis (6.6%), Paget's disease (0.7%), or no

TABLE 1—Rates of Primary Total Hip Arthroplasty, US Medicare Sample, 1986 through 1989

Age Group, y	Men		Women	
	No. Observed Cases	Rate per 10 000(95% CI)	No. Observed Cases	Rate per 10 000 (95% CI)
65–69	655	12.5 (11.5, 13.5)	886	13.5 (12.6, 14.4)
70–74	639	15.2 (14.0, 16.4)	1036	18.1 (17.0, 19.2)
75–79	484	17.0 (15.5, 18.5)	872	19.3 (18.0, 20.6)
80–84	229	14.2 (12.4, 16.1)	508	16.2 (14.8, 17.6)
85–89	70	9.7 (7.4, 12.0)	157	8.7 (7.4, 10.1)
90–94	12	4.9 (2.1, 7.7)	27	3.4 (2.1, 4.7)

Note. Total hip arthroplasties done in the absence of prior hip surgery, hip fracture, infection, or cancer were included. CI = confidence interval.

coded indication (11%). (More than one diagnosis was listed for 5% of cases.)

Women had modestly higher total hip arthroplasty rates than men (RR = 1.13, 95% confidence interval [CI] = 1.07, 1.19) (Tables 1 and 2). For both genders, rates increased with age up to about 80 to 84 years, with declines thereafter. Blacks had markedly lower rates than Whites (RR = 0.53, 95% CI = 0.47, 0.61).

Serious complications were uncommon. About 2.5% of patients died within 6 months of operation, and 3.7% died within a year. No single comparison with the Medicare population was possible since the survival curves crossed; after 9 months from surgery, however, survival was better than in the general Medicare population (P = .0001 for overall survival curve differences). Mortality was higher in male patients and patients more than 74 years of age (data not shown); there were too few outcomes among Blacks to permit racial comparisons.

Additional hip surgery was performed in 1.8% of total hip arthroplasty cases within 1 year, in 3.2% within 2 years, and in 4.2% within 3 years. Infections were identified in less than 1% of patients, even after 2 years. Pulmonary embolism occurred in about 2% of total hip arthroplasties within 6 months but rarely subsequently. Age and gender had no substantial effect on these outcomes.

Discussion

Using a strict definition of primary total hip arthroplasty and multiple Medicare data files, we found that use rates were modestly higher for women than for men and much higher for Whites than for Blacks. Serious complications were uncommon.

TABLE 2—Factors Associated with Primary Total Hip Arthroplasty

	Odds Ratio[a]	95% CI
Age group, y		
65–69	1.00	. . .
70–74	1.27	1.19, 1.36
75–79	1.39	1.29, 1.49
80–84	1.16	1.06, 1.26
85–89	0.67	0.58, 0.77
Gender		
Male	1.00	. . .
Female	1.13	1.07, 1.19
Race		
White	1.00	. . .
Black	0.53	0.47, 0.61

Note. Total hip arthroplasties done in the absence of prior hip surgery, hip fracture, infection, or cancer were included.
[a]Poisson regression analysis restricted to Black or White subjects under 90 years old. The model included age group, gender, race, and census division.

Other investigators have studied total hip arthroplasty in defined populations. In Olmsted County, Minn,[14] use patterns among elderly people were broadly similar to those we have reported here. Previous US national analyses used hospitalization data and included patients previously undergoing surgery, but reported findings consistent with ours regarding use patterns and mortality.[8–10] Investigations from the United Kingdom and Sweden also indicate a low risk of complications after total hip arthroplasty.[13,15]

Suggestions that Blacks have a lower prevalence of hip osteoarthritis than Whites[16] could possibly explain the use

patterns we observed. However, racial differences in the only relevant American study were not statistically significant.[17] Differences in treatment preferences or access to care could also explain our findings. Financial barriers are largely equalized by Medicare, but fewer referrals for surgery could limit access. In any case, our results are consistent with the lower Black use of several major medical procedures.[18–25]

Our analyses have several strengths, including broad population coverage and a large sample size. Medicare coding of total hip arthroplasty has been validated,[26] and death after 65 years of age is accurately captured.[27] Our use of both hospital and physician claims facilitated case ascertainment and permitted exclusion of patients previously undergoing surgery. However, medical care provided by Veterans Administration hospitals could have led us to underestimate total hip arthroplasty rates in men.

Our identification of previous surgery, or revision surgery, after total hip arthroplasty is clinically sensible and is supported by the generally accurate Medicare coding of major surgical procedures.[26] However, our ascertainment of infections relies less securely on coded diagnoses. Since Medicare coding lacks indications of laterality, patients with bilateral total hip arthroplasty might have distorted our analysis. After a total hip arthroplasty observed during our period of study, complications could have actually occurred in a previous such procedure. This should be uncommon, however, because it requires the coincidence of complications and bilateral arthroplasty. Important issues we could not study include the long-term risk of infection and revision, useful topics for future analyses. Our data also could not address functional status after total hip arthroplasty, which has, however, been previously studied.[28–32]

These data demonstrate that primary total hip arthroplasty is commonly performed in the United States with only rare serious complications. The lower use in Blacks requires further investigation; study of racial differences in osteoarthritis, barriers to access, and personal preferences seems warranted. □

Acknowledgments

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