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The Use of Hyaluronic Acid and Corticosteroid Injections Among Medicare Patients With Knee Osteoarthritis

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A B S T R A C T

Introduction: Hyaluronic acid (HA) and corticosteroid (CS) injections are frequently used in the management of osteoarthritis (OA) of the knee, despite a lack of strong evidence supporting their efficacy in the literature. The purpose of this study is to evaluate trends in HA and CS usage in Medicare patients over the past 15 years.
Methods: The Medicare 5% national sample database was used to identify 581,022 patients (representing an estimated 11.6 million) with a diagnosis of knee OA between 1999 and 2013.
Results: The percentage of newly diagnosed knee OA patients who received any injection trended from 39% in 1999 to 47% in 2006 and then declined to 37.5% in 2013. However, the mean number of injections per newly diagnosed OA patient nearly doubled from 0.27 to 0.45 for CS and from 0.18 to 0.36 for HA. Among those having both HA and CS injections, 69% had CS as first-line treatment, whereas 31% had HA first.
Conclusion: The percentage of newly diagnosed knee OA patients receiving injections peaked in 2007 and then decreased steadily through 2013, as did the proportion of patients receiving HA injections as first-line therapy. However, the number of injections per patient has increased significantly over the past 15 years in both groups.

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Hyaluronic acid (HA) and corticosteroid (CS) injections are frequently used in the management of osteoarthritis (OA) of the knee. The use of intraarticular (IA) injections remains controversial based on limited and conflicting evidence regarding their clinical efficacy [1-6]. There have been several meta-analyses and multitude of clinical trials attempting to provide guidance to treating physicians. However, little is known about the actual incidence or utilization of these procedures. In 2008, the Clinical Practice Guideline (CPG) from the American Academy of Orthopaedic Surgeons (AAOS) regarding nonarthroplasty management of OA of the knee concluded that the published reports on the subject of HA and CS injections as treatment modalities for knee OA were inconclusive, and then the CPG was revised in 2013, concluding that HA for patients with symptomatic OA of the knee could not be recommended [7]. Given that there are relatively few available intraarticular therapies for treatment or palliation of symptoms related to OA of the knee, we hypothesized that the number of injections per Medicare patient would increase over the period of this analysis despite the lack of conclusive evidence supporting the use of corticosteroid or HA injections.

Methods

Medicare beneficiaries with knee OA were identified from the 5% sample of the Medicare data (1999-2013) using diagnosis codes 715.x6 only or 719.46 and 715.x8, 715.x9, or 715.x0. This study was limited to patients aged 65 years and older, as those younger than 65 years are enrolled in Medicare from their physical disabilities, end-stage renal disease, or Lou Gehrig disease. HMO enrollees, those not enrolled in both parts A and B of Medicare, and non-US residents were also excluded from this study, due to their incomplete claim history.

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The use of HA and CS injections in the knee OA patients was identified using the respective J and Q HCPCS codes (see Appendix). This also required the concurrent diagnosis codes 715.x6, 719.06, 719.46, 719.56, or 719.76 to limit the injections to the knee joint. We calculated the percentage of patients who received injection therapy over time. In addition, the number of injections per newly diagnosed patient who underwent HA or CS injections was assessed by year (after adjusting for the 5% sample), as well as which type of injection was used as first-line therapy.

Statistical Methods

Sampling survey methodology was used to estimate the national usage and trends in HA and CS injections, based on the present 5% sample Medicare data. Univariate statistics were used to calculate the average and other quantiles of time duration from OA diagnosis to injection of CA or HA. Data preparation and analyses for the present study were carried out using the SAS statistical software (version 9.4).

Results

A total of 581,022 Medicare patients with knee OA were identified from the 5% Medicare data between 1999 and 2013, corresponding to an estimated 11.6 million knee OA patients in the Medicare population during this period. Of the 581,022 knee OA patients, 7.2% (n = 42,185) had both HA and CS injections, whereas 20.4% (n = 118,955) had only CS injections and 4.6% (n = 26,829) had only HA injections. The remaining knee OA patients did not undergo HA and/or CS injections during this period.

We also noted the type of provider who administered the HA and CS injections, finding that most (62.6%) were given by orthopedic surgeons. The remainder was shared by a variety of specialties including rheumatology (10.3%), family practice (7.4%), internal medicine (6.0%), physician's assistants (4.9%), physical medicine and rehabilitation (2.7%), and many others with 1% or less. There were no significant associations found between the type of injection (CS or HA) and the type of administering provider.

The age of Medicare knee OA patients undergoing CS and/or HA injections has decreased over the timeframe of this analysis (Fig. 1). Of the HA only patients, 50.3% were aged 65 to 69 years in 2013, compared to 30.1% in 1998. Similarly, 41.4% of CS only injection patients were aged 65 to 69 years in 2013, compared to 26.4% in 1998. Although most patients receiving injections of any type are female, there are an increasing proportion of males. In 2013, 38.0% of HA only injection patients were male compared to 32.9% in 1998, and 38.4% of CS only injection patients were male in 2013 compared to 27.8% in 1998.

Fig. 2 demonstrates the percentage of newly diagnosed knee OA patients who received treatment with injections. The percentage that got either type of injection trended steadily upward from 1999 to 2006 where it peaked at 47% and then trended back down to 37.5% in 2013. The group having both types (CS + HA) showed a lower but very similar trend. However, the HA only and CS only curves remained fairly flat over the same period.

In contrast, the number of injections per newly diagnosed OA patient in the Medicare population increased from 0.27 to 0.45 for CS and doubled from 0.18 to 0.36 for HA (Fig. 3). Over the same period, the total number of injections per patient more than tripled from 0.27 to 0.83. Interestingly, both groups demonstrated a sharp decrease in 2008, coincident with the US economic downturn. However, the trend quickly resumed its rise after 2008.

Among patients who received both types of injections (HA + CS group), 31% had HA injection before any use of CS, whereas the remainder underwent CS injections first (69%). Based on combined counts of all groups, 79% have CS injections first, whereas 21% of patients had HA as a first-line treatment. Fig. 4 shows the trend in first-line IA injection over time. The percentage of patients receiving HA injections alone has remained stable between 4% and 5%. However, within the CS + HA group, the percentage of patients getting HA injections as a first-line treatment peaked in 2008 at 34% and has declined by 50% since that time to 17% in 2013.

Discussion

Intraarticular injection therapy for symptomatic OA of the knee is widely used in the United States. The efficacy and cost-effectiveness of these treatment modalities is frequently debated, and recommendations have changed over time as evidence regarding the clinical efficacy (or lack thereof) has accumulated. In 2008, the AAOS CPG for Treatment of Osteoarthritis of the Knee reviewed the subject of IA injections. It suggested that the evidence supporting the use of HA injections was

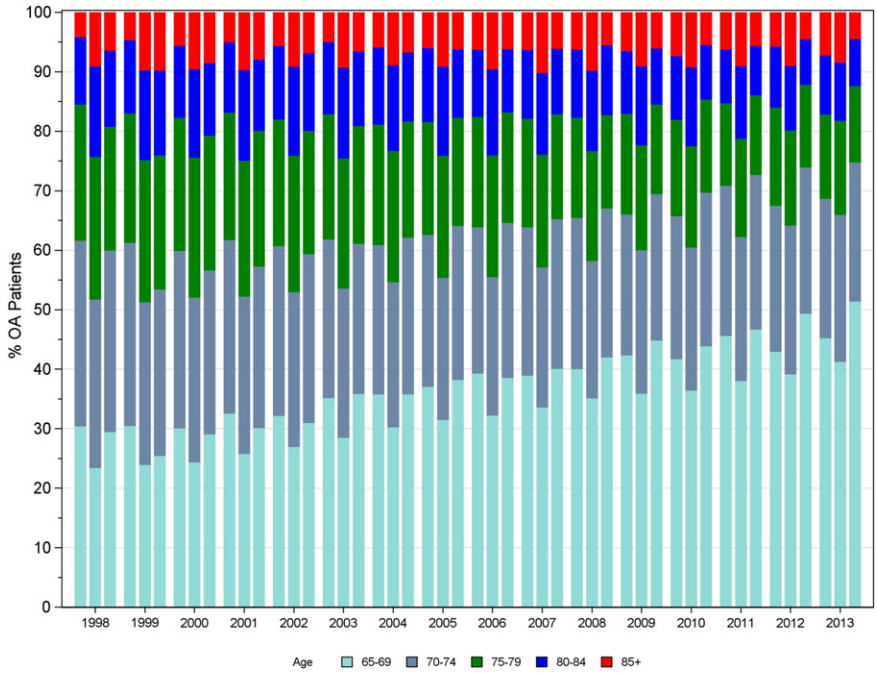

Fig. 1. Age distribution for knee injections in Medicare patients with diagnosis of OA by year. Each triplet represents a single year with 3 groups: CS + HA injection (left), CS only injection (middle), and HA only injection (right) patients.