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Research Article

The use of ambulatory blood pressure monitoring among Medicare beneficiaries in 2007–2010

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Abstract

The US Centers for Medicaid and Medicare Services reimburses ambulatory blood pressure monitoring (ABPM) for suspected white coat hypertension. We estimated ABPM use between 2007 and 2010 among a 5% random sample of Medicare beneficiaries (≥65 years). In 2007, 2008, 2009, and 2010, the percentage of beneficiaries with ABPM claims was 0.10%, 0.11%, 0.10%, and 0.09%, respectively. A prior diagnosis of hypertension was more common among those with versus without an ABPM claim (77.7% vs. 47.0%). Among hypertensive beneficiaries, 95.2% of those with an ABPM claim were taking antihypertensive medication. Age 75–84 versus 65–74 years, having coronary heart disease, having chronic kidney disease, having multiple prior hypertension diagnoses, and having filled multiple classes of antihypertensive medication were associated with an increased odds for an ABPM claim among hypertensive beneficiaries. ABPM use was very low among Medicare beneficiaries and was not primarily used for diagnosing white coat hypertension in untreated individuals. J Am Soc Hypertens 2014;8(12):891–897.

Keywords: Hypertension; reimbursement claims; white coat hypertension.

Introduction

More than 20 years ago, Pickering et al introduced the concept of white coat hypertension.[1] White coat hypertension is defined as having blood pressure that is elevated when measured in the clinic but not elevated when assessed by ambulatory monitoring in individuals not taking antihypertensive medications.[2] This is now a well–recognized phenomenon, estimated to be present in 15%–25% of patients with elevated clinic blood pressure.[1,3,4] It is generally accepted that the risk of cardiovascular disease events in patients with white coat hypertension is relatively low compared with those with both elevated clinic and ambulatory blood pressure (ie, sustained hypertension).[3] Additionally, the benefits of antihypertensive treatment in patients with white coat hypertension have been reported to be limited.[5]

In 2001, the Centers for Medicaid and Medicare Services (CMS) in the United States (US) approved reimbursement for ambulatory blood pressure monitoring (ABPM) when

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Conflicts of interest: Dr Kent received salary support for Amgen Inc. Dr Viera has served on the Medical Advisory Board for Suntech Medical as well as a Hypertension Advisory Board for Daiichi Sankyo. Drs Kilgore and Muntner received institutional grants from Amgen Inc. Dr Muntner also served on an advisory board for Amgen Inc. There are no other potential conflicts of interest.

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white coat hypertension is suspected.[6] In 2011, based on cost–effectiveness data, the National Institute for Health and Clinical Excellence (NICE) in the United Kingdom recommended that ABPM be performed to confirm the diagnosis of hypertension in individuals presenting with clinic hypertension.[7] A recently published 2013 European Society of Hypertension Position Paper further emphasized the important role of ABPM in the diagnosis of white coat hypertension, as well as in identifying other important blood pressure phenotypes (eg, masked hypertension, nocturnal hypertension, blood pressure variability).[3]

Given the high incidence of clinic hypertension among older adults,[8] one would anticipate that ABPM use would become common after the reimbursement for suspected white coat hypertension was approved by CMS. However, it is not known how frequently ABPM is being utilized in older patients in the US. The aim of this study was to estimate national rates of ABPM use, time trends, and correlates of use among US Medicare beneficiaries. Additionally, we investigated factors associated with the performance of ABPM among Medicare beneficiaries with a diagnosis of hypertension.

Methods

Using previously described methods,[9,10] we conducted a study of Medicare beneficiaries in the US using the 2006–2010 national 5% random sample from the CMS. Medicare is a US federal insurance program that covers individuals 65 years of age and older, on disability, or who have end–stage renal disease. Coverage may be chosen on a fee–for–service basis or through contracts with managed care organizations (ie, Medicare Advantage). Specific data used for the current analyses include claims from Medicare fee–for–service Parts A (in–patient), B (out–patient), and D (prescription drug). These data provide Medicare claims, whether reimbursed or not, and assessment data linked by beneficiary across the continuum of care. We did not include Medicare beneficiaries with coverage through a managed care organization in the current analysis, as claims are incomplete for these individuals. CMS and the Institutional Review Board at the University of Alabama at Birmingham approved the study.

To examine ABPM utilization and time trends, we created separate yearly cohorts of beneficiaries in 2007, 2008, 2009, and 2010. In each calendar year, beneficiaries with an ABPM claim in Medicare were identified from outpatient claims that contained Healthcare Common Procedure Coding System (HCPCS) codes 93,784, 93,786, 93,788, or 93,790 (see Supplemental Methods, available online only). For beneficiaries with multiple ABPM claims in a calendar year, the first ABPM claim of the year was chosen. A beneficiary could be counted in multiple calendar years if they had an ABPM claim in more than one year. We refer to the date that the ABPM was performed as the ''index date.'' Beneficiaries without ABPM claims in a calendar year were identified and assigned an index date of July 1.

A ''look–back'' period was used to identify antihypertensive medication use and comorbidities. The look–back period for this analysis included the 365 days prior to, but not including, each participant's index date (with January 1, 2006 being the earliest possible date in the look–back period for our study). Beneficiaries were required to have continuous full Medicare coverage (Medicare Parts A, B, and D coverage) and to reside in the 50 United States or Washington, DC for the entire look–back period. In order to have the sample represent the general population that is eligible for Medicare, we excluded from the analysis beneficiaries who were <65 years of age at the start of the 365–day look–back period. Additionally, due to concerns about data accuracy, we excluded beneficiaries who were ≥ 110 years of age on the index date, or who had multiple birth or death dates. A CONSORT diagram showing the inclusion/exclusion of US Medicare beneficiaries in our study is provided in Supplemental Figure 1 (available online only).

Covariates

A priori–selected covariates were used to characterize Medicare beneficiaries with ABPM claims. Demographics were defined using the Medicare beneficiary enrollment file and included age, gender, race/ethnicity, and Medicaid enrollment for the entire look–back period (a measure of poverty). Comorbid conditions were defined using claims during the look–back period and previously published algorithms (see Supplemental Methods, available online only). These included diabetes, coronary heart disease, stroke, and chronic kidney disease.[11] We also determined the number of separate days for which each beneficiary had a claim for hypertension (outpatient physician evaluation and management claims with ICD–9 diagnosis of 401.x — malignant, benign, or unspecified essential hypertension). Hypertension was defined by outpatient physician evaluation and management claims with ICD–9 diagnosis codes of 401.x on two or more separate days during the look back period. White coat hypertension was defined by one or more inpatient, carrier, or outpatient claims with an ICD–9 diagnosis code of 796.2 (ie ''elevated blood pressure reading without diagnosis of hypertension'').[12] The number of antihypertensive medication classes each beneficiary filled during the look–back period was identified from the Medicare Part D file. Antihypertensive medication classes were defined using those listed in the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) guidelines[11] and were updated, following review by two authors (DS, SO), to include new medications.