

Impact of Race/Ethnicity in OA Treatment

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Introduction

Racial/ethnic disparities in the use of joint replacement surgery for knee and hip osteoarthritis (OA) have long been described [4, 9, 23]. Whether these represent differences in the frequency and severity of OA at various joint sites [11, 12] or differences in patient preference, access to medical care, or other factors has been the source of considerable study in the last 10 to 15 years [6]. This article emphasizes racial/ethnic differences in, and factors associated with, the use or lack of use of various therapeutic interventions for OA, and new insights into potential mechanisms underlying these disparities, with an eye toward understanding how effective modalities might be applied in various populations likely to benefit.

Ethnic Disparity in Care of OA

In 1995, Hoagland and colleagues reported a study of racial/ethnic differences in total hip arthroplasty (THA) in 17 hospitals in the San Francisco area between 1984 and 1988 [9]. Whites were twice as likely as Blacks to have THA, with even lower rates in Hispanic, Filipino, Japanese, and Chinese. While Asians have now been shown to have lower rates than Whites of hip OA that would warrant THA [19], Blacks in the USA have at least equal frequency and severity of hip OA to Whites [11, 24]. Data from the

Johnston County Osteoarthritis Project (JoCo OA) provided evidence that African Americans (AAs) have specific radiographic features that were associated with hip OA progression and THA in elderly white women in the Study of Osteoporotic Fractures, suggesting possible unmet need in AAs [14, 18].

Similarly, despite having at least equal, if not higher, frequency and severity of knee OA [2, 6, 12], AAs are much less likely to undergo total knee arthroplasty (TKA) than Whites [4, 23]. *Healthy People 2010*, a public health blueprint for the nation, set the elimination of these disparities in the use of TKA for knee OA in adults aged 65 and older as a specified goal [25]. Disappointingly, a recent analysis showed that while the use of this therapeutic intervention had increased 58% overall between 2000 and 2006, AAs continued to be much less likely to undergo this procedure than Whites [4]. Lavernia and colleagues reported that AAs presented pre-operatively for THA and TKA with worse scores than Whites on measures of pain, physical function, and well being; while each group improved post-operatively, AAs continued to have worse scores than Whites up to a mean of 5 years post-operatively [15]. Ibrahim and colleagues observed that AAs in VA Hospitals were less likely than Whites to know about THA and TKA and have different attitudes toward acceptance or consideration of these procedures [10]. More recently, this group reported that orthopedic clinic visits with AA veterans tended to have less discussion of biomedical issues and more rapport-building discussion than with White patients, but no differences were found in the length of visits, overall amount of dialogue, discussion of psychosocial issues, or other means of communication [8]. Another study noted that Blacks, Hispanics, and Asians in California were more likely to have TKA in low volume hospitals [16].

Racial/ethnic differences in pain, function, pain processing, and gait, all of which can affect OA and the propensity to use THA, TKA, and other therapeutics, have also been noted. Allen et al. reported that compared to Whites, AAs in the *JoCo OA* with knee OA had worse pain and function

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that was not explained by radiographic severity, but was related to differences in body mass index and depressive symptoms [1]. AAs were also more likely than Whites to have lateral compartment involvement in knee OA, which was not explained by differences in static knee alignment [3, 17]. Consistent with this observation, Chang et al. reported that AAs in the Osteoarthritis Initiative (OAI) were more likely than Whites to have valgus thrust (Fig. 1) [5]. AAs have also been noted to have slower gait speed and lower knee range of motion and loading rate and to take longer to reach peak maximum ground reaction force [21]. In addition to these differences in biomechanics, Singh and colleagues reported differences in allodynia between AA and White men and women in the Multicenter Osteoarthritis Study (MOST), most notably higher in AA women; but no differences were found in pinprick or temporal summation [22]. No differences in pain pressure threshold were noted in AA and White men and women in the *JoCo OA*. Recent genetic variants in the μ -opioid receptor in AAs have been reported, which altered function and changed responsiveness to established μ -opioid receptor ligands [7]. Whether changes such as these are related to racial/ethnic differences in pain and response to medications remains to be tested.

Ethnic Disparity and Future Research

In addition to disparities in the use of THA and TKA, race/ethnicity may influence the use of other relevant therapeutic modalities. AAs are less likely than Whites to be prescribed and to take narcotic prescriptions, sleep medication, and prescription sleep medication and are more likely to use prayer to relieve pain [13, 20]. Whether AAs or other racial/ethnic groups are less willing than Whites to accept intra-articular injections, post-traumatic joint repair, or use of bracing/devices is unknown. Such issues are critical in the design of clinical trials which test such modalities in post-traumatic and idiopathic OA as well as in the dissemination of effective therapies, including THA and TKA in ethnically diverse populations.

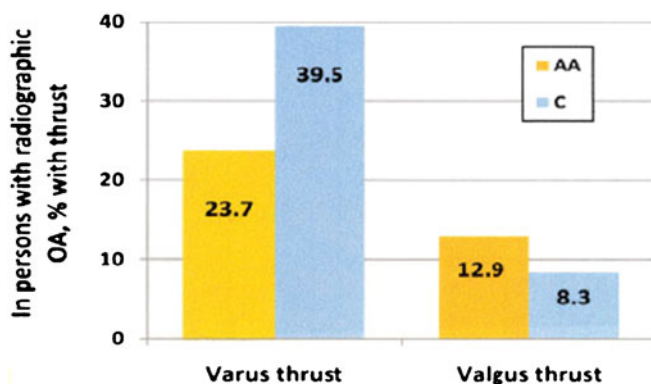


Fig. 1. African American and Caucasian OA patients with thrust when walking. (Reprinted from Chang et al. [5] copyright 2010, with permission from John Wiley and Sons)

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