



## Original Article

# Asian ethnicity: a risk factor for adhesive capsulitis?☆

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## ABSTRACT

**Objective:** The aim of this study was to evaluate whether Asian ethnicity is a risk factor for the development of adhesive capsulitis. The secondary aim was to describe the distribution of cases of capsulitis by age group.

**Methods:** A cross-sectional study comparing the rate of adhesive capsulitis in individuals of Asian ethnicity with that of other ethnicities. We excluded patients with fractures and those with symptoms not involving the shoulder. The odds ratio was adjusted for confounding factors by binary logistic regression.

**Results:** A total of 1331 patient records were evaluated and after applying the selection criteria, 814 patients remained. We found 134 cases of adhesive capsulitis (15.6%). The peak of incidence was at 60–64 years in the patients of Asian ethnicity and at 55–59 years in the other patients. The unadjusted odds ratio was 4.2 (CI 95%, 2.4–7.4), while the odds ratio adjusted for sex and diabetes mellitus was 3.6 (CI 95%, 2.0–6.5).

**Conclusion:** Patients of Asian ethnicity showed an independent risk factor for the development of adhesive capsulitis, with an adjusted odds ratio of 3.6. Adhesive capsulitis was more common between 55 and 64 years.

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## Etnia Asiática: um fator de risco para a capsulite adesiva?

## RESUMO

**Objetivo:** Avaliar se a etnia asiática é um fator de risco no desenvolvimento da capsulite adesiva. Os objetivos secundários foram descrever a prevalência da capsulite adesiva no ambulatório especializado em ombro e a dispersão dos casos de capsulite por faixa etária.

## Palavras-chave:

Fatores de risco

Capsulite adesiva

☆ Study conducted at Grupo de Ombro e Cotovelo, Instituto de Ortopedia e Traumatologia, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, São Paulo, SP, Brazil.

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Distribuição por raça ou etnia  
Estudo comparativo  
Ombro  
Etiologia

**Métodos:** Estudo transversal que comparou a taxa de capsulite adesiva na etnia asiática (casos) com outras etnias (controles). Excluímos pacientes com fraturas e sintomatologia que não envolviam o ombro. O risco relativo foi exposto em razão de chance, ajustado para fatores confundidores por uma regressão logística binária.

**Resultados:** Foram avaliados os prontuários de 1.331 pacientes. Após aplicação dos critérios de seleção, restaram 814. Observamos 134 casos de capsulite adesiva (15,6%). O pico de incidência foi aos 60-64 anos na etnia asiática e 55-59 anos nas demais. A razão de chance não ajustada foi de 4,2 (IC 95%, 2,4 a 7,4), enquanto a ajustada para sexo e diabetes mellitus foi de 3,6 (IC 95%, 2,0 a 6,5).

**Conclusão:** A etnia asiática se mostrou um fator de risco independente para o desenvolvimento da capsulite adesiva, com uma razão de chance ajustada de 3,6. O diagnóstico de capsulite adesiva esteve presente em 15,6% da amostra, com pico entre 55 e 64 anos.

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## Introduction

Adhesive capsulitis is a disease affecting 2–5% of the population.<sup>1</sup> Symptoms include pain, which varies according to the phase of the disease,<sup>2</sup> and limited passive and active joint movement.<sup>3</sup> Its cause is unknown,<sup>4</sup> and it mainly affects middle-aged women.<sup>5</sup> Some risk factors have been described in comparative studies, including diabetes mellitus,<sup>4–7</sup> hyperlipidemia,<sup>6</sup> hypothyroidism,<sup>8</sup> hyperthyroidism,<sup>9</sup> genetic predisposition,<sup>10,11</sup> heart disease<sup>12</sup> and Parkinson's Disease.<sup>13</sup> Other predisposing factors cited, but based only on case series or reports, include prolonged immobilization,<sup>14</sup> previous trauma,<sup>15</sup> and HIV infection.<sup>16</sup> The patient's psychological profile, however, is not correlated with the emergence of the disease.<sup>17,18</sup>

The influence of ethnicity as a predictive factor for the development of adhesive capsulitis has been little studied. White ethnicity<sup>19</sup> and being born in the British Isles<sup>4</sup> have been described as risk factors. However, information on the other ethnic groups is lacking in the literature. The clinical impression of the authors is that patients of Asian ethnicity have a higher chance of developing the disease. However, this is merely a supposition, as there are no studies to support this hypothesis.

The primary objective of this study was to evaluate whether Asian ethnicity is a risk factor for the development of adhesive capsulitis. The secondary objectives were to describe the dispersion of capsulitis cases by age group.

## Methods

### Design

A cross-sectional study was conducted, based on the database of two authors attended between January 7, 2015 and May 25, 2016. The work was approved by the Ethics Committee of the institution under number 1195.

### Participants

Patients with adhesive capsulitis (cases) consisted of individuals who, on physical examination, presented restricted passive and active movement, and who did not present significant changes in the X-ray, except for osteopenia or calcific tendinitis, according to a consensus published by Zuckerman and Rokito.<sup>3</sup> In addition, all patients underwent magnetic resonance imaging (MRI) or ultrasound. We excluded patients with fractures or symptoms not involving the shoulder. The controls were patients without a diagnosis of adhesive capsulitis seen at the same outpatient clinic. The sample was stratified by age group (5-year intervals) and only age groups that included patients with adhesive capsulitis were considered.

### Evaluation methods

The database was built using FileMaker (FileMaker Incorporation, Santa Clara, CA, USA). Using this tool, an Excel spreadsheet (Microsoft Corporation, Redmond, WA, USA) was created, with the following data: ethnicity, age, sex, diabetes mellitus, hypothyroidism, heart disease, neurological disease, and diagnosis. Ethnicity was categorized as Asian ethnicity or other ethnicities. Age was recorded in complete years at the time of the first visit, and categorized in 5-year intervals. The diagnosis was recorded as: adhesive capsulitis, rotator cuff tendinopathy, partial rotator cuff tear, complete rotator cuff tear, calcific tendinitis, shoulder instability, SLAP tear, glenohumeral arthrosis, acromioclavicular arthritis, and others. For subsequent analysis of risk factors, the patients were regrouped into adhesive capsulitis or others. The remaining variables were categorized as present or absent.

### Statistical analysis

The data on prevalence of the different shoulder disorders were expressed as absolute values and percentages. The general characteristics of the sample for age, sex and comor-

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