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### RESEARCH PAPER

# The ethnic background of the prevalence of different rheumatological diseases in a tertiary care hospital of North-East India -a hospital-based observational study

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**Background and aims:** The prevalence of rheumatological diseases varies among different populations across the globe. Moreover, different ethnic groups in the same population or geographical regions also show diversity in rheumatological disease epidemiology. We realised that there are not many studies about this beneficial correlation in the North-Eastern part of India. Hence, we decided to report the same. **Material and Methods:** A total of 800 patients of >12 years of age, irrespective of gender, attended the Rheumatology outpatient department (OPD) of Gauhati Medical College and Hospital (GMCH), Assam, India and fulfilled the standard diagnostic criteria for rheumatological diseases were included in the study. **Results:** Out of 800 patients in our study, 52.5% had Rheumatoid Arthritis (RA), 12% had Spondyloarthropathy (SpA), and 9% had Systemic Lupus Erythematosus (SLE). Other reported disorders were Mixed Connective Tissue Disease (MCTD) (8.6%), Sjogren's Syndrome (5.3%), gout (5.2%), fibromyalgia (3.8%) and Systemic sclerosis (3.6%). Among the ethnic groups, RA was most prevalent among Kayastha (29.1%), followed by Bengali Muslim (22.1%), Brahmin (11.7%), Manipuri Meitei (8.3%), Boro (4.8%). SLE was more prevalent in the ethnic group Kaibarta (30.6%), followed by Kayastha (22.2%) and Ahom (8.3%). At the same time, SpA was commonly seen among the Kayasthas (33.3%), followed by the Bengali Muslims (29.2%), Brahmins (7.3%) and Manipuri Meitei (4.2%). **Conclusion:** There is a high prevalence of different rheumatological diseases among the people inhabiting the North-Eastern part of India. Different ethnic groups have a varied predisposition to the conditions. Further research is warranted to establish the concept of regional ethnic diversity and disease epidemiology.

**Keywords:** Rheumatological diseases; Ethnicity; North-East India.

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## INTRODUCTION

Depictions of ethnicity may vary by context as distinct meanings are usually assigned about different clinical practice objectives, medical and social science research, national surveillance of health statistics and even census by census.<sup>1</sup>

The risks of developing different ailments vary according to cultural and ethnic origin. It is commonly known that patients from different ethnic backgrounds have varied beliefs

about disease, its causality or management, which are primarily affected by cultural or communication obstacles.<sup>2-4</sup> Inhabitant groups of specific regions with differences governed by culture, creed or ethnicity also illustrate differences in their illness behaviour.

Identifying and analysing ethnic variation in disease epidemiology can generate signals towards environmental or genetic factors that affect disease risk. If an ethnic

difference in disease risk has an environmental justification, this difference is supposed to ‘wear off’ within a few generations after migration.<sup>5</sup> If, on the other hand, genetic factors underlie an ethnic difference in disease risk, we would expect this ethnic difference to persist in populations where migrants have been settled overseas for many generations and to be observed consistently in all countries where a different migrant group has settled.

Ethnic factors such as beliefs and cultural context, comprehended by language and social factors, affect access to and outcome of healthcare related to chronic diseases. Due to globalisation, the ethnic distribution of a nation is vastly influenced by the movement of ideologies across the traditional natural border, pattern of migration and political debate. To confront these challenges restructuring of healthcare delivery system is a prerequisite.<sup>6</sup>

Where there has been a mixture between ethnic groups that differ in risk for disease, studies of how the risk for illness varies among them can help distinguish between genetic and environmental explanations for the difference in disease risk and help define the specific genetic model.<sup>5</sup>

Northeast India comprises eight states with different ethnic groups who came from different directions at other historical times. The tribes of Northeast India may be considered specific examples of variation and diversity of biosocial and cultural life in terms of susceptibility to different diseases, including rheumatological disorders.

No adequate studies have yet been undertaken on the risk for various rheumatological disorders like SLE, RA, etc., to admixture in populations of northeast India. The present study is one of its kind in this direction, which was objectivist to identify such ethnic propensity or variability towards rheumatological disorders in this specific Indian geography.

## MATERIAL AND METHODS

The study was conducted among the patients attending the Rheumatology OPD of GMCH, Assam, India, within one year from August 1<sup>st</sup> 2018, to July 31<sup>st</sup> 2019.

**Inclusion criteria:** All patients attending the Rheumatology OPD of our unit were included irrespective of age and sex.

**Exclusion criteria:** Patients having a non-rheumatological diagnosis or incomplete data were excluded from the study.

**Diagnosis:** Clinical diagnosis and differentials were reached from comprehensive history and physical examination supplemented by appropriate and relevant laboratory investigations, as shown in **Table 1**. Appropriate laboratory investigations were utilised to confirm the diagnosis, assess disease severity, and modify treatment in line with the specific requirement during the initial and follow up visits.

**Table 1** List of investigations

Sl.No.	Investigations
1	Complete blood count
2	Blood urea, serum creatinine, random blood sugar, liver function tests
3	Serum uric acid level
4	Thyroid profile
5	Rheumatoid factor
6	Anti-CCP antibody
7	HLA-B27 typing
8	Radiological investigations (X rays of joints including the knee, lumbosacral spine, X-rays of hands and feet, chest Xray)
9	MRI
10	Coomb’s test
11	ANCA
12	Investigations 1-4 were done routinely in all patients; the rest were planned according to the presentation of patients
13	ANA assay including various specific antibodies

Distinct updated diagnostic criteria were used for the diagnosis of different rheumatological disorders. Like ACR/EULAR<sup>6</sup> Criteria for Rheumatoid Arthritis,<sup>7</sup> Modified New York Criteria (1984) for Ankylosing Spondylitis,<sup>8</sup> Revised American Rheumatism Association Criteria for Systemic Lupus Erythematosus (SLE)<sup>9</sup> and Kahn Criteria for Mixed Connective Tissue Disease (MCTD) were used to reach the confirmatory diagnosis.

**Statistical analysis:** Appropriate descriptive statistical methods were utilised to describe the analysis of this simple observational study.

**Ethical consideration:** Ethical approval was taken from the ethics committee of Gauhati Medical College and Hospital.

The broader reference list of ethnic communities inhabiting the Northeast part of India is shown in **Table 2**.<sup>10-14</sup>

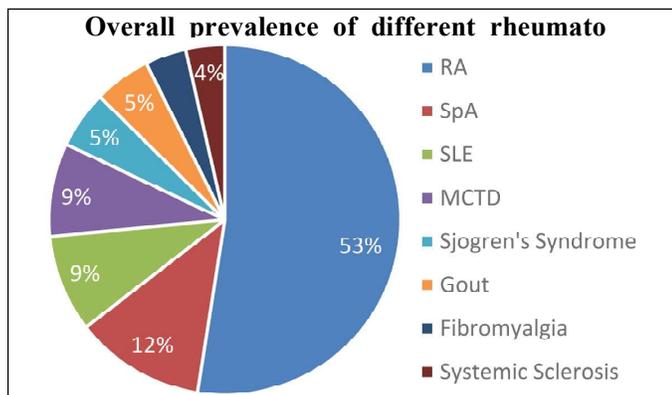
**Table 2** Ethnic communities in Northeast India

Name of State	Ethnic communities
Assam	<b>Assamese people:</b> Ahoms, Assamese, Brahmins, Assamese Kayastha, Bodo, Rabha, Tiwa, Karbi, Dimasa, Mising, Rajbongshi, Deori, Garo, Khasi, Santal, Chutiya, Bodo-Kachari, Tea tribes of Assam, Bengali, Muslims, Tai phake people, Tibeto-Burman, Jalia kaibarta, Khamyang people, Sutradhars of Assam Nath.

<b>Arunachal Pradesh</b>	Monpa, Adi, Nyishi, Tangsa, Mishmi, Hill, Miri, Chakma, Tagin, Hrusho, Padam, Minyong, Jingpo, Bugun, Galo, Lisu, Chugpa, Memba, Miju, Mishmi, Tai phake, Deori, Tani, Tutsa, Na
<b>Manipur</b>	Meitei, Tangkhul, Gangte, Pangal, Liangmai, Vaiphei, Poumai, Rongmai, Maring Naga, Maram Naga, Monsang Naga, Manipuri Brahmin, Mao Naga, Kom people, Anal Naga, Sukta people, Bishnupuria Manipuri people, Manipuri Kshatriyas
<b>Meghalaya</b>	Khasi, GaroJ, aintia, Bengali, Nepali, Hajong, Biate, Koch, Tiwa, Rabha, Kuki, Sheikh
<b>Mizoram</b>	Lusei people, Pawi, Paite, Mara, Ralte, Hmar
<b>Nagaland</b>	Angami Naga, Lotha Naga, Ao Naga, Rengma Naga, Chakhesang Naga, Phom Naga, Pochury Naga, Khaimniung Naga
<b>Tripura</b>	Bengalis, Tripuri people include- • Debarma • Tripura • Reang • Jamatia • Koloi • Noatia • Murasing • Uchoi • Rupini; Chakma people, Halem tribe, Panoriya

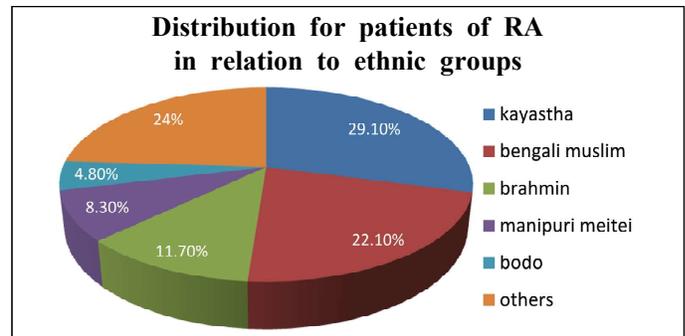
**RESULTS**

Out of 800 patients in our study, 52.5% (420/800) had RA, 12% (96/800) had SpA, 9% (72/800) had SLE. Other rheumatological disorders were MCTD (8.6%), Sjogren's Syndrome (5.3%), gout (5.2%), fibromyalgia (3.8%) and Systemic sclerosis (3.6%), as shown in **Figure 1**.



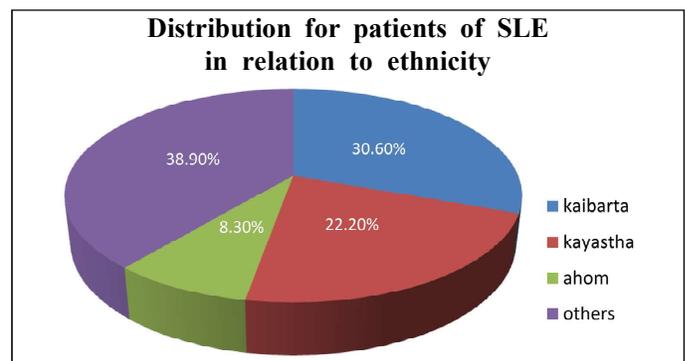
**Figure 1** Overall prevalence of different rheumatological diseases

If we see the ethnic distribution for rheumatoid arthritis (RA), the most common rheumatological illness in this study, it was found most prevalent among Kayastha (29.1%), followed by Bengali Muslim (22.1%), Brahmin (11.7%), Manipuri Meitei (8.3%) and Boro (4.8%).



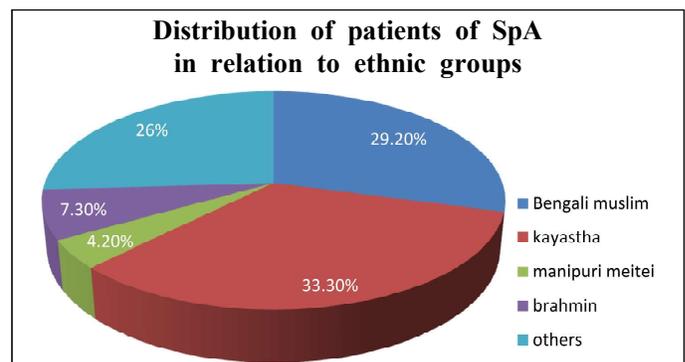
**Figure 2** Distribution for patients of RA about different ethnic groups

SLE was most prevalent in the ethnic group Kaibarta (30.6%), followed by Kayastha (22.2%) and Ahom (8.3%). Others include- Sutradhar (2.8%), Garo (2.8%), Chutia (2.8%), Nepali (2.8%), Bengali Muslim (5.6%), tea tribe (2.8%), Naga latha (2.8%), Keot (5.6%), Manipuri Meitei (5.6%), Rajbongshi (5.6%). The distribution of SLE in the different ethnic groups is shown in **Table 3**.



**Figure 3** Distribution for patients of SLE about ethnicity

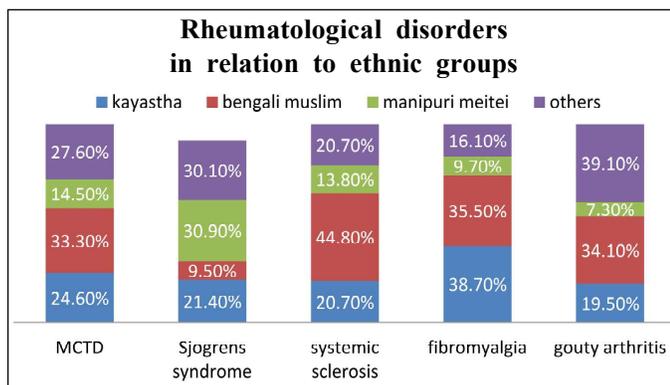
The SpA was most prevalent among the Kayasthas (33.3%), followed by the Bengali Muslims (29.2%), Brahmins (7.3%) then by group Manipuri Meitei (4.2%). Other groups reporting with SpA were Kaibarta (2.1%), Khasi (1.04%), Garo (1.04%), Karbi (1.04%), Nath (3.1%), Koch (3.1%), Hira (1.04%), Sutradhar (2.1%), Rajbongshi (3.1%), Jain (2.1%), Bodo (3.1%), Tea tribe (3.1%) and Keot (2.1%)



**Figure 4** Distribution of patients of SpA with ethnic groups

In our study, we found that MCTD was most prevalent among the Bengali Muslims (33.3%), followed by Kayasthas (24.6%) and Manipuri Meitei (14.5%). Sjogren's Syndrome was most prevalent among the patients from the Manipuri Meitei community (30.9%), followed by Kayasthas (21.4%) and Bengali Muslims (9.5%). Systemic sclerosis had the highest prevalence among Bengali Muslims (44.8%), followed by Kayasthas (20.7%) and Manipuri Meitei (13.8%). Fibromyalgia was found to be most prevalent among the Kayasthas (38.7%), followed by Bengali Muslims (35.5%) and Manipuri Meitei (9.7%). Gouty arthritis was most prevalent among patients from the Bengali Muslim community (34.1%), followed by Kayasthas (19.5%) and Manipuri Meitei

Others like Ahom (2.8%), Chutia (0.4%), Keot (0.2%), Khasi (0.2%), Teatribe (0.7%), Nath (1.2%), Naga (1.7%), Nepali (1.4%), Kaibarta (3.6%), Rajbongshi (3.3%), Rabha (1.7%), Kumar (1.2%), Koch (1.4%), Khasi (2.1%) and Deori (0.7%).



**Figure 5** Prevalence of rheumatological disorders in different ethnic groups

Looking at Figure 5, we can infer that MCTD was most prevalent among the Bengali Muslims (33.3%), followed by Kayasthas (24.6%) and Manipuri Meitei (14.5%). Sjogren's Syndrome was most prevalent among the patients from the Manipuri Meitei community (30.9%), followed by Kayasthas (21.4%) and Bengali Muslims (9.5%). Systemic sclerosis had the highest prevalence among Bengali Muslims (44.8%), followed by Kayasthas (20.7%) and Manipuri Meitei (13.8%). Fibromyalgia was found to be most prevalent among the Kayasthas (38.7%), followed by Bengali Muslims (35.5%) and Manipuri Meitei (9.7%). Gouty arthritis was more prevalent among the Bengali Muslim community (34.1%), followed by Kayasthas (19.5%) and Manipuri Meitei (7.3%).

## DISCUSSION

Rheumatological diseases like RA, SpA, SLE are quite prevalent in India, and their prevalence varies in different racial groups and geographical areas. To the best of our knowledge, this study is one of the first studies that describe various rheumatic diseases reported in the tertiary health

care facility in Assam and mapped their prevalence against various ethnic groups. There are overall 106 ethnic groups that live in this region, covering 262179 km<sup>2</sup> of geographical area. Out of these, 17 different ethnic groups reported rheumatic disorders at our centre, whose data was captured in our study. We observed wide variation in the prevalence of these diseases among various ethnic groups.

Rheumatoid arthritis was most prevalent among the rheumatological diseases, followed by Spondyloarthritis and Systemic Lupus Erythematosus in our study. Another study based on COPCORD (community-oriented program for control of rheumatic diseases) published in 2015 also reported a high burden of RA in India with a point prevalence of 0.7%.<sup>15</sup> RA is also the most studied disease among rheumatological conditions written by Misra DP et al.<sup>16</sup> The reported prevalence of RA in India is almost like that among developed countries. However, it is higher than the disease load in China, Indonesia, the Philippines, and rural Africa. This data is in line with the fact that the population from north India is genetically closer to Caucasians than other ethnic groups.<sup>17</sup>

Rheumatological diseases were more commonly reported in some ethnic groups like Kayastha, Bengali Muslim, Kaibarta, Bengali Muslim and Manipuri Meitei. RA was more widely seen among Kayastha, Bengali Muslim and Brahmin ethnicities. At the same time, SpA was more frequent among Kayastha, Bengali Muslims and Manipuri Meitei.

As per our data, Kaibarta ethnic group reported the highest prevalence of SLE. Other groups in which SLE was prevalent included Kayastha and Ahom. We could not find any published literature reporting the prevalence pattern of SLE based on ethnicity among the population of North-East India. Though a few researchers previously discussed the ethnic distribution of SLE, reporting 2.5 times higher incidence and prevalence reported in South Asian ethnic groups than white Caucasians irrespective of their country of birth.<sup>18</sup> Even the disease expression is also observed to be different in different ethnic groups. Clinical indications like renal involvement, disease severity, photosensitivity etc., show variations in various ethnicities.

Looking at the currently available data, both increased prevalence and diverse disease manifestation have some solid genetic basis. However, this area needs a lot more meticulous research to arrive at a factual conclusion.

## CONCLUSION

The data from our study leads to the conclusion that there is a high prevalence of different rheumatological diseases among the people inhabiting the North-Eastern part of India, with different ethnic groups having a varied predisposition to the conditions. Like in the rest of India, Rheumatoid

Arthritis is also the most prevalent rheumatological disorder in North-East India. We strongly feel that this study will be an eye-opener for researchers further to investigate disease prevalence and variation among various ethnicities.

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