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Research Article

PREVALENCE OF RHEUMATIC DISEASES IN URBAN BIKANER POPULATION IN WESTERN RAJASTHAN: A WHO-ILAR COPCORD STUDY

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ABSTRACT
COPCORD (Community oriented program from control of rheumatic diseases) is a global initiative of the WHO/International League of Associations from Rheumatology (ILAR). The prevalence data from Urban Area, Bikaner District, North-Western Rajasthan Carried out in 2008-09, is presented. The aim was to study the urban prevalence of rheumatic-musculoskeletal symptoms/diseases (RMSD). A cross-sectional survey of the urban population of Bikaner (non-randomised selection) was completed in five weeks, using validated questionnaires, served by trained volunteers. 356 patients (7.12%) were identified (Phase 1) from 5000 adults, and systematically evaluated (Phase 2 and 3) by a medical team, including a rheumatologist; limited investigations were carried out and diagnosis confirmed during a planned 12 week initial follow-up. Standard clinical criteria were used for the diagnosis; point prevalence estimates (prev) are shown in parenthesis. There was a dominant distribution of 'pain at all sites' (articular/soft tissues) in the females (5.06%); as compared to males (2.06%). 51.4% RMSD were due to Osteoarthritis (females 33.99%; males 17.42%), Inflammatory arthritis (RA) as classified by the American College of Rheumatology, ranking second [35.67% (females 28.93%; males 6.74%)], Unclassified ill defined (4.21%). Spondylosis (Lumbar 2.53; Cervical 1.12%, Cervical and Lumbar 1.12%), Post Traumatic Arthritis (1.12%), Low backache spondylitis, Soft Tissue Rheumatism and Osteoarthritis with spondylosis (0.56% each), 1 person (0.28%) was suffering with prosthetic arthritis, 1 (0.28%) person was suffering with Trigeminal Neuralgia with wrist pain. TB, leprosy, gout and connective tissue disorders were not observed. The Bikaner COPCORD survey demonstrates a significant urban spectrum of RMSD. It provides a reasonable speculation about the Indian rheumatological burden with osteoarthritis and rheumatoid arthritis scoring first and second respectively.

INTRODUCTION
In 1981, World Health Organization (WHO) and International League of Associations for Rheumatology (ILAR) launched a special program for rheumatic diseases called COPCORD (Community Oriented Program for Control of Rheumatic Disease) (Muirden, 1997)). It's objective was to acquire data on the prevalence of rheumatic-musculoskeletal symptoms/diseases (RMSD), along with their disability, in particular from the rural communities in the developing countries. COPCORD was to target the needs of the community rather than define specific diseases/syndromes. The COPCORD epidemiological model envisages three stages – collection of prevalence data (I), identification of risk factors (II), and control of "risk factor" and improved health care primarily through health education (III). In stage I, which is essentially a population survey, the data is conventionally collected in three successive phases – population demography and identification of patients with RMSD (Phase 1), detail record of patient's narration of history and symptomatology, and functional disability (Phase 2), and a detail rheumatological evaluation (Phase 3). The COPCORD model advocates a low cost structure utilizing available ground resources with minimal use of investigations (for diagnosis). Numerous Asian Pacific countries have completed COPCORD survey (Mananan *et al., .,* 1991; Wigley, 1994). Under the aegis of APLAR (the Asia-Pacific League of Associations for Rheumatology), the first Indian COPCORD survey was conducted Bhigwan (Dist Pune) in 1996 (Chopra *et al.,* 1997).

The current report presents the final results of Stage 1, phase 3 of the Bikaner (urban) COPCORD survey, and compare them with the results of the COPCORD rural surveys from Bhigwan (India) (Chopra *et al.,* 2001), North China (Wigley *et al.,*1994) and Indonesia(Darmawan *et al.,*1992) and urban Australia (Wigley, 1994). Detail Bhigwan survey methodology, including the questionnaires used, have been published (Chopra *et al.,* 1997). Detail diseases descriptive of patients were excluded to keep this report concise.

MATERIALS AND METHODS

Bikaner District is situated North-Western Rajasthan. The area selection was randomized and guided by senior co-workers (HST), a doctor divided into 4 areas (Lalgarh, Kailash Puri, Karni Nagar and Purani Ginnani). The census state 1 survey was completed in 2008. Over 12 week period where by all the 3 phases were carried out concurrently, total population surveyed was 5000. The COPCORD medical team included one rheumatologist (AC), MBBS Doctor, medicine residents, educated volunteers (age group 19-40 year) from the urban area after training served COPCORD health workers (CHW). The questionnaires were served in Hindi language through personal interviews by the CHWs. In Phase 1 questionnaire, the respondent recorded general demographic data, past and current RMSD, and other medical problems. Besides a human manekin for marking the painful sites, the Phase 2 questionnaire contained queries regarding community concepts, socioeconomic effects, health assessment (HAQ) in terms of functional impairment, medical resources and therapies used. The HAQ (Fries *et al.,* .,1980) used was modified to cater to the Indian customs of daily living (e.g. squatting and sitting cross legged) and livelihood (e.g. cycling and bullock carts for transportation). The total HAQ score (maximum 24) was averaged for eight activities; arbitrarily classified into mild (0-0.9), moderate (1-1.9) and severe (2-3). Respondents with past or current RMSD completed Phase 2 questionnaire before the final rheumatology evaluation. Each patient was classified with a provisional diagnosis by AC following the clinical evaluation; investigations were ordered when indicated. Facilities for ESR, hemogram, and urinanalysis was set up in the area. Other relevant investigations (e.g. rheumatoid factor (RF), ASO, X-ray LS spine, serum uric acid etc.) were carried out in centre for rheumatic diseases (CRD), S.P. Medical College, Bikaner all serum samples were stored at -80°C, even after testing.

Follow Up: The survey patients were systematically re-evaluated during the initial 12 week post survey period. The diagnosis was finalized, sometimes after reviewing the lab results. During the late follow up program, the COPCORD medical team continued to visit the village every 3-4 weeks. Treatment was begun and closely monitored.

Disease Classification And Database: Patients of RA were also classified as per the American Rheumatism Association/College of rheumatology (ACR)'s 1987 criteria (Arnett *et al.,* .,1988). Standard textbook criteria (Schumacher,1993) were applied for the clinical diagnosis of ankylosing spondylitis (AS), gout, soft tissue rheumatism (STR), juvenile chronic arthritis (JCA), rheumatic fever arthritis (RhFA), osteoarthritis (OA), Spondylosis, connective tissue disorders (CTD) e.g. SLE. In case of chronic non inflammatory knee pain the diagnosis of OA was based on presence of either of the following features – significant crepitus, restricted range of movement, varus deformity, palpable medical joint line tenderness, palpable osteophytes, skiagrams were referred to when available. Patients with diffuse STR were also classified as per the ACR criteria for fibromyalgia (Arnett *et al.,* 1988). Patients with only focal enthesitis e.g. tendoachillitis, ankle tenosynovitis, etc. were classified as regional forms of STR, RMSD in a large number of patients could not be classified into a better known diagnostic entity and these were then broadly labeled as "unclassifiable" with a subcategory indicating the anatomy of the affected region.

Though the survey database has been continuously reviewed, the number of patients (identified during the survey) remained constant. Our study diagnosis/disease classification format ensured comparability with other COPCORD studies.

Statistics: All individuals $\geq$ 15 years age have been considered as adults. Point – prevalence-estimates (prev) have been calculated on a survey population of 5000. The 95% confidence intervals ($z\alpha$=1.96) for prev was calculated using the method for ratios and proportions[11].

RESULTS

Basic rural demographics: A total of 5000 subjects were surveyed, 4995 were adults (49.02% were females and 50.88% were males).

The age distribution of the Bikaner surveyed subjects in this study is compared to the 2001 Indian census population (Fig. 1).

Table 1: Survey Population (Phase 1) and patients Identified (phase 2): age-sex distribution (percent)

Age group (yrs)	Survey Population N=(5000)			Patients identified (n=356)		
	Male (n=2548)	Female (n=2452)	Total	Male (n=103)	Female (n=253)	Total (n=356)
1-14	0.08	0.02	0.10	0	0.30	0.30
15-24	10.2	9.1	19.3	1.40	1.40	2.80
25-34	10.5	11.2	21.7	2.20	7.30	9.60
35-44	12.0	12.7	24.7	3.70	17.10	20.80
45-54	9.5	7.7	17.2	6.20	17.40	23.60
55-64	4.6	4.5	9.1	6.20	14.90	21.10
>64	4.0	3.9	7.9	9.30	12.60	21.90

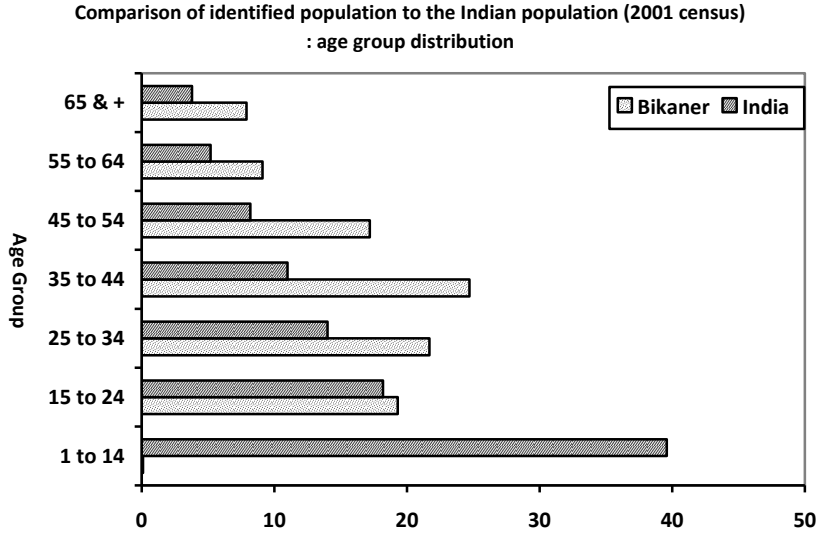

Figure 1: Comparison of study subjects to the Indian population (2001 census) : Age group distribution)

The age-sex distribution of the population and the identified patients from Bikaner is shown in table 1. Males dominate (51%) (sex ratio = 0.9:1). The population was multiracial (72% Hindus, 25% Muslims, 3% others). 40% were labourers, 38% were govt. employed and rest were unemployed. Almost 80% of the women were in the age group 21-54 years worked both in home and field.

Table 3: Prevalence of rheumatic complaints by "site" in Bikaner urban and selected rural Asina-Pacific COPCORD surveys (percent)

Pain Location	Present Study			Bhigwan (India) (n=4092)	Indonesia (n=4683)	China (n=4213)	Australia (n=1437)
	Male (n=2548)	Female (n=2452)	Total (n=5000)				
Pain any site	2.1	5.1	7.1	17.9	24	NA	NA
Neck	0.02	0.1	0.12	6.5	5.0	4.6	17.0
Shoulder	0.08	0.38	0.46	7.4	11.0	4.6	10.0
Elbow	0.12	0.24	0.36	5.9	10.0	4.0	6.3
Hand/Wrist	1.14	2.68	3.82	7.3	NA	NA	NA
Knee	1.76	4.48	6.24	12.7	12.2	27.0	15.0
Ankle/Feet	0.92	2.36	3.28	8.0	NA	NA	NA
Calf	0.00	0.08	0.08	6.5	NA	NA	NA
Thigh	0.00	0.08	0.08	NA	NA	NA	NA
Hip	0.00	0.08	0.08	NA	NA	NA	NA
Sole	0.00	0.08	0.08	NA	NA	NA	NA
Upper Back	0.00	0.00	0.00	7.9	5.3	1.5	6.2
Lower Back	0.00	0.00	0.00	11.9	15.1	28.0	22.0

Patients Phase 2 Data*:* A total of 356(7.1%) patients were identified of them 2.1% were males and 5.1% were females, all of them were adults. RMSD was the single dominant problem in the community. Both males and females suffered maximum with pain at the knee (females 4.8% males 1.76%) followed by pain at hand wrist with female dominance (2.68% Vs 1.14%).

Table 4: Rheumatic disease in Bikaner urban, comparable rural Asia-Pacific COPCORD and the Delhi Survey: Point Prevalence estimate

Disease	Present Study	Prev	95% CI	Bhigwan (India)[4]	Delhi (India)[3]	Indonesia	China	Australia
TNG	1	0.02	-	-	-	-	-	-
PA	1	0.02	-	-	-	-	-	-
OA	183	3.66	1.5-2.7	5.8	1.89	5.1	-	8.2
RA	127	2.54	2.8-6.8	0.51	0.75	0.2	0.3	0.7
STR	2	0.04	-	5.5	2.07	15.0	-	5.8
UNC	15	0.30		-	-	-	-	-
PTA	4	0.08		-	-	-	-	-
SP	2	0.04	-	-	-	-	-	
OASP	2	0.04	-	-	-	-	-	-
Spondilosis	17	0.34		-	-	-	-	-
LB	2	0.04	-	-	-	-	-	-

TNG – Trigeminal Neuralgia; PA – Prosthetic Arthritis; OA – Osteoarthritis; RA – Rheumatoid Arthritis; STR – Soft Tissue Rheumatism, UNC – Unclassified; PTA – Post Traumatic Arthritis; SP – Spondilytis; OASP – Osteoarthritis with spondylosis; LB – Low Back Pain; CI – Confidence Interval

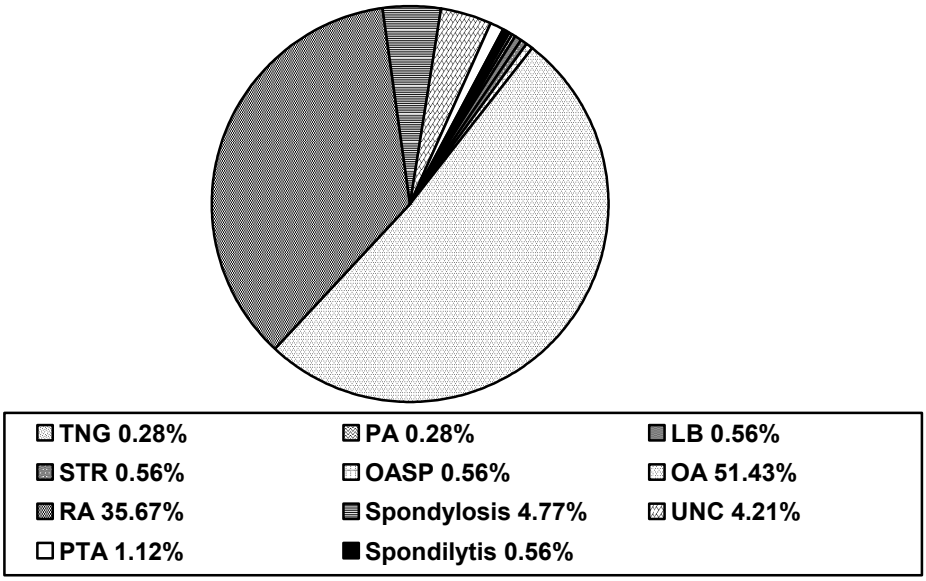

Figure 2: Distribution of RMSD

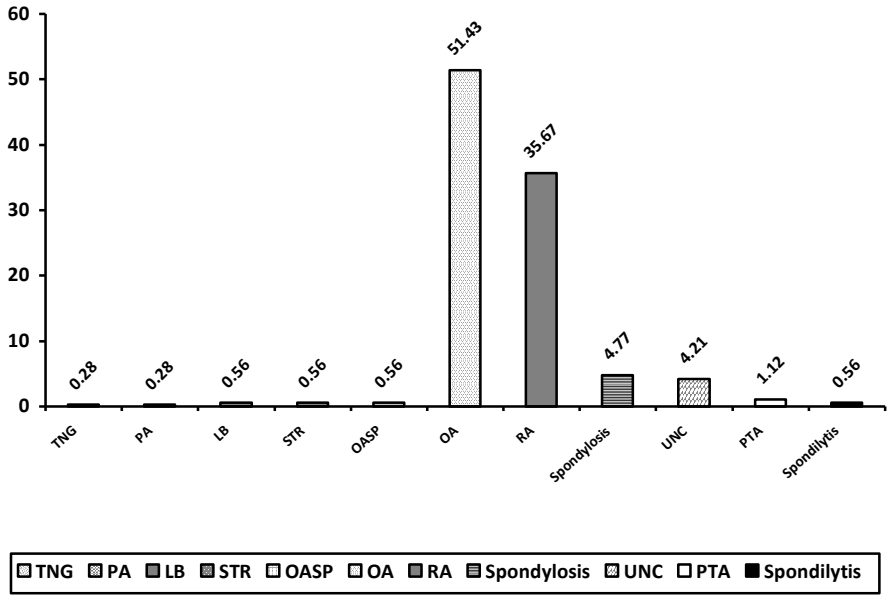

Figure 3: Bar Diagram Showing Distribution of RMSD

Patients-Phase 3: Lack of medical records and the unsupervised rampant use of steroids, both injectable and oral, in this area often made the initial clinical evaluation of synovitis difficult and misleading. Only an intense initial follow up could reveal the true nature of the articular profiles in several patients. Five elderly female patients with generalized OA was later found to also suffer from seropositive RA. Three male patients of soft tissue rheumatism were lateral grouped as RA.

The distribution of RMSD is shown in figure 2 & 3 (OA dominated with 51.4% followed by RA – 35.6%, 4.21% could not be classified into any category because of variable symptomatology and lack of laboratory support). The prevalence is compared to selected COPCORD studies (Wigley *et al.,* 1994), Darmawan *et al.,* (1992)) and a non-COP-Cord Indian study (Chopra *et al.,* 1988) in table 3.

Osteoarthritis: The prevalence (Table 4) includes all forms of OA-knee, spinal and primary generalized. Chronic knee pains, were observed in 240 patients (Male:Female: 8.71). Total prevalence is 3.66% (95% CI is 1.5-2.7).

RA: Clinical RA was diagnosed in 127(35.6%) patients (103 males and 24 females) according to ACR criteria. 56 patients were seropositive for rheumatoid factor ($\geq$ 80 IU/ml). Diagnostic radiological erosive arthritis (hands and/or feet) was seen in 35 patients (27.56%). The prevalence of RA was 2.54% (95% CI 2.8-6.8).

Spondylosis: This group constituted 3rd largest distribution with prevalence 0.34% (95% CI 0.8-7.0) with M:F 2.4:1. All subjects identified with clinical features, X-ray and negative ESR.

PTA: 4 subjects with prevalence of 0.08% (95% CI 0-3.2), all of them were male with definite history of trauma and X-ray suggestive of ankylosis and erosion.

Spondylitis: 2 subjects with prevalence of 0.04% M:F 1:1 with clinical feature and lab investigation of spondylitis.

Others: Two subjects identified with soft tissue rheumatism with prevalence of 0.04% and they both were male. One female with trigeminal neuralgia and one female with prosthetic arthritis were identified, 2 females were diagnosed as osteoarthritis with spondylosis.

Unclassified : Fourth major group total 5 patients with prevalence of 0.30% (95% CI 0.9-8.9) with all efforts they could not be classified into any category despite of extensive follow up and lab investigations. No patients was diagnosed with skeletal tuberculosis or gout or other connective tissue disorders despite of thorough investigation and clinical surveys.

DISCUSSION

A wide spectrum of RMSD is seen in the Indian subcontinent. The likely socio-economic impact of these diseases has been made evident by WHO-COPCORD surveys in several developing countries (Muirden,1997; Wigley,1994). The current report on Bikaner urban survey is an eye opener for several reasons other than the prevalence statistics. These results shift the focus away from hospital referral practice to the grass root rural community. The problems of diagnosis, especially with reference to lack of disease markers in rheumatology, and the dominant community problems (STR, OA and SRD) are highlighted.

Epidemiological information on rheumatological diseases is sparse in india (Malaviya *et al.,*1993). As compared to first Indian rural COPCORD study (Bhigwan) (Chopra *et al.,* 2001)), prevalence of disease is less (7.12% vs 18.2%) similar to that study osteoarthritis dominated (3.66% vs 5.8%). STR was significantly less prevalent (0.04% vs 5.5%) in our study and RA was dominated (2.54% vs 0.51%). Prevalence of RA is significantly higher when compared to Asian rural COPCORD and other rural population studies. The ACR criteria, used universally, have major limitations in "picking up" RA with seronegative asymmetric arthritis, inactive or partially treated disease, early mild disease, episodic flare-up, dominant foot disease; rheumatoid nodules, a diagnostic criteria, are sparse in the India population (Chopra *et al.,* 1997). Genetic studies could not be performed in our study.

Differences in the prevalence of RMSD from the Asian Pacific countries (Wigley, 1994) are bound to exist due to cultural and ethnic diversity, especially concerning occupation and living conditions. Australia, a developed country, provides interesting comparison with the other Asian COPCORD e.g. the high prevalence of neck and back pain in Australia can not possibly be due carrying loads for daily living and occupation which otherwise are likely to be important risk factors for urban Bikaner population.

Dominant symptomatology in Bikaner study as compared to Bhigwan (Chopra *et al.,* 2001)was knee pain (6.24% vs 12.7%) followed by pain at ankle/feet (3.28% vs 8.0%), significant less subjects complained of neck pain as compared to Bhigwan study5. Overall symptoms prevalence was less as compared to

Bhigwan study (Chopra *et al.,*2001) establishing the fact that prevalence and burden of the disease is much more in rural community as compared to urban community. These data are not applicable for large scale as community based surveys are required to extrapolate the disease pattern. One fact is clearly made out of the study that occupation has got definite relation with the disease, symptoms and deformities. All subjects working as laboruer suffered with pain and disability much more as compared to those engaged in less exertion, those who were going for regular exercise revealed less disability.

High prevalence of knee pain in our community is related with the posture and activities which put excessive stress on knee joint and lack of healthful skeletal rehabilitation.

Population based epidemiological surveys are demanding in several ways – from socioeconomics to the actual methodology adopted. Often there is a trade off between the two latter considerations. Illiteracy, subject poverty, insufficient population/health records with are poorly keep and maintained, spares facilities for travel and communications, lethargic and often passive bureaucracy, corrupt political will, crisis oriented short sighted health planning are some of the major hurdles in planning epidemiological programs in developing countries, much more so for non communicable diseases. Fortunately, the Bikaner COPCORD model did not encounter any major problem. The community and its caretakers, with their overwhelming cooperation and participation, have been singularly responsible for the success of the survey and the follow up program.

The Bikaner COPCORD, the Bhigwan COPCORD (Chopra *et al.,* 2001) and Delhi study (Ganguly *et al.,* 1997), though providing excellent projections of the likely rheumatological burdens of the Indian population, can not be considered to represent the national scenario in toto. A national task force for need to generate national statistics though pooled data.

REFERENCES

Muirden KD (1997). The origins, evolution and future of COPCORD. *APLAR Journal of Rheumatology* **VI** 44-8.

Mananan WR, Muirden KD, Caragay R *et al.,* (1991). Rheumatic diseases in a Phillipine village II : a WHO-ILAR-APLAR COCORD study, phases II and III. *Rheumatology International* **11** 157-61.

Wigley RD (1994). Rheumatic problems in the Asia Pacific region. In Wigley RD ed. The primary prevention of rheumatic diseases, New York. The Parthenon Publishing Group Inc. 21-5.

Chopra A, patil J Billampelly V, Relwani J, Tandale HS (1997). The Bhigwan (India) COPCORD: Methodology and first information report. *APLAR Journal of Rheumatology* **1** 145-51.

Chopra A, Patil J, Billempelly V, Relwani J and Tandle HS (2001). Prevalence of Rheumatic Diseases in a Rural Population in Western India: A WHO-ILAR COPCORD study. *Journal of the Association of Physicians of India* **49** 240-246.

Wigley RD, Zhang N, Zeng Q *et al.,* (1994). Rheuamtic disease in China. ILAR – China study comparing the prevalence of rheumatic symptoms in Northern and Southern rural populations. *Journal of Rheumatol* **21** 1484-96.

Darmawan J, Valkenburg HA, Muirden KD, Wigley RD (1992). Epidemiology of rheumatic disease in rural and urban populations in Indonesia : World Health Organization International League Against Rheumatism (COPCORD study, state I, Phase 2, *Annals of Rheumatic Diseases* **51** 525-8.

Fries JF, Spitz P, Krainer RG, Holman HR (1980). Measurement of patients outcome in arthritis. *Arthritis and Rheumatism*; **23** 137-45.

Arnett FC, Edworthy SM, Blotch A *et al.,* (1988). The American rheumatism association 1987 revised criteria for the classification of rheumatoid arthritis. *Arthritis and Rheumatism* **31**:315-24.

Schumacher HR (1993). Jr. Primer on the Rheumatic Diseases. Atlanta : The Arthritis Foundation.

Glantz SA (1992). Primer of biostatistics. New York Mc Graw Hill Inc. 188-216.

Malaviya AN, Singh RR, Singh YN, Kapoor SK, Kumar A (1993). Prevalence of systemic lupus erythematosus in India. *Lupus* **2** 115-8.

Chopra A, Raghunath D, Singh S, Subramanian ARS (1988). Pattern of rheumatoid arthritis in the Indian population. *Br Journal of Rheumatology* **27** 454-6.

Ganguly KS, Roy M (1997). An epidemiological study of rheumatoid arthritis in an urban Indian population in a district of West Bengal. *Journal of Indian Rheumatism Association* **5** 91-100.