



A radiological study of the rheumatoid hand in black South Africans

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Objective. To determine wrist and hand involvement in black South African patients with rheumatoid arthritis.

Methods. Larsen scoring of the wrist and hand was done in 75 patients. The mean finger score was 9.67 (range 0 - 100) on the left hand and 10.3 (range 0 - 100) on the right. Scores for the wrists were 2.5 (range 0 - 5) for the left and 2.7 (range 0 - 5) for the right.

Conclusion. Finger and thumb involvement were considerably less in the South African black population than in other series consisting mainly of white patients.

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There are only a few publications on rheumatoid involvement in black South Africans.^{1,3} These publications do not address wrist and hand involvement specifically in black patients. However, when treating black patients one gets the impression that the wrist is more severely affected than the rest of the hand.

In his thesis on rheumatoid arthritis (RA) in the Western Cape, Mody² states that the wrist is more severely affected in blacks. He also states that no other interracial differences have been noted.

The aim of the present study was to determine the severity of wrist and hand involvement in black RA patients in the Pretoria region of South Africa.

Patients and methods

A retrospective study was done of 75 black patients with confirmed RA. Patients with a disease duration of less than 2 years and patients with onset of the disease before 18 years of age were excluded. Standard X-rays of the hands were used and evaluated in the following way.

The metacarpo-phalangeal (MP) and proximal interphalangeal (PIP) joints of the fingers and the MP and interphalangeal (IP) joints of the thumb and wrist were scored according to the Larsen⁴ scoring system (Table I). The four authors looked at the X-rays and agreed on the consensus score of a joint. The range of scores for the radiographs was 0 - 100 for the hand. Each of the 20 joints was scored out of 5. The wrist was also scored out of 5.

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Table I. Radiographic grading of rheumatoid arthritis according to Larsen, Dale and Eek⁴

Grade	Description
Grade 0, normal conditions	Abnormalities not related to arthritis, such as marginal bone deposition, may be present
Grade 1, slight abnormality	One (or more) of the following lesions is present: peri-articular soft-tissue swelling, peri-articular osteoporosis and slight joint-space narrowing
Grade 2, definite abnormality	Small erosions are present in the finger and toe joints. Joint-space narrowing is not obligatory in these joints. In the large joints, joint-space narrowing must be present, erosions being not obligatory
Grade 3, marked abnormality	Erosions and joint-space narrowing must be present
Grade 4, severe abnormality	The original articular surfaces are still partly preserved
Grade 5, mutilating abnormality	The original articular surfaces have disappeared. Gross deformation is present

Results

The average age of the patients at the time the X-rays were taken was 49 years, and the average duration of the disease at that time was 7.5 years. There were 12 male and 63 female patients.

The results of the radiological grading of the hand according to Larsen's⁴ criteria are shown in Table II. The mean score for the left hand was 9.67 (range 0 - 100) and that for the right 10.29 (range 0 - 100). The Larsen score was 2.48 (range 0 - 5) for the left wrist and 2.73 (range 0 - 5) for the right wrist (Table III).



Table III. Average scoring (%) of the wrist, MP joint and IP joints of the thumb, 2nd - 5th MP joints and 2nd - 5th PIP joints*

	Wrist		1st MP joint		IP joint thumb		2nd - 5th MP joints		2nd - 5th PIP joints	
	N	%	N	%	N	%	N	%	N	%
Larsen 0										
Left	17	11.30	48	64	59	79	173	28.80	150	25
Right	13	8.70	60	80	60	80	164	27.30	142	23.7
Total	30	20	108	72	119	79	337	56.2	292	48.7
Larsen 1										
Left	6	8	7	9	7	9	57	9.5	78	13
Right	8	10	11	15	5	7	49	8.2	64	10.7
Total	14	9	18	12	12	8	106	17.7	142	23.7
Larsen 2										
Left	9	12	7	9	3	4	20	3.3	43	7.2
Right	7	9	8	11	2	3	34	5.7	62	10.3
Total	16	11	15	10	5	3	54	9	105	17.5
Larsen 3										
Left	15	20	2	3	0	0	21	3.5	19	3.2
Right	16	21	1	1	2	3	11	1.8	18	3
Total	31	20	4	3	2	1	32	5.3	37	6.2
Larsen 4										
Left	15	20	4	5	2	3	13	2.2	4	10.6
Right	15	20	1	1	0	0	18	3	3	0.5
Total	30	20	5	3	2	1	31	5.2	7	1.2
Larsen 5										
Left	11	15	2	3	2	3	20	3.3	6	1.0
Right	15	20	3	4	4	5	20	3.3	11	1.8
Total	26	17	5	3	6	5	40	6.7	17	2.8

*Looking at the table it is obvious that most finger joints were either a Larson 0 with no involvement or a Larson 1 with very little involvement, while most of the wrist joints were Larson 3, 4 or 5 which indicates severe involvement. MP = metacarpo-phalangeal; IP = interphalangeal; PIP = proximal interphalangeal.

Table II. Comparison of involvement of the wrist, MP joints, IP joints of the thumb and PIP joints on the Larsen scale (0 - 5)

Wrist	MP 1	MP 2	MP 3	MP 4	MP 5	IP thumb	PIP 2	PIP 3	PIP 4	PIP 5
Left hand	0.73	1.35	1.17	0.79	0.85	0.42	0.93	0.99	0.75	0.93
Right hand	0.67	1.36	1.29	0.93	0.84	0.48	0.93	1.05	0.95	1.19

MP = metacarpo-phalangeal joint of the thumb; IP = interphalangeal joint of the thumb; PIP = proximal interphalangeal joint.



The right wrist was slightly more affected than the left wrist, but there was never a difference of more than 1 Larsen scale point between the 2 wrist joints. Of 75 patients, 26 had a Larsen score of 4 - 5 for the left wrist joint and 30 patients had a Larsen score of 4 - 5 for the right wrist joint. From these findings it is apparent that almost half of the wrist joints were severely affected.

The total score (the score out of 100) for the fingers of the more severely affected wrists with a Larsen score of 4 or more was 15 for the left side and 13.6 for the right side. The finger joints of the hands were only mildly affected, even in those patients with severely affected wrist joints. In only 9 patients with a wrist score between 0 and 3 was the total score for the fingers more than 15 points, and in only 19 of the 75 patients was the total finger score more than 15.

The index finger was the most severely involved MP joint on both the left and right sides. The PIP joints of the right side were slightly more affected than on the left side. The IP and MP joints of the thumb were seldom affected.

Discussion

Mody² found that only the wrists were more severely affected in black patients. A casual observation would tend to confirm this impression. However, if one compares the results of this study with those of the study by Mody *et al.*¹ on handedness and deformities, their mean score for MP and PIP joints of the right hand was 19.47 and for the left hand 17.99. Our results are much lower – 10.29 for the right hand and 9.67 for the left hand, almost half the involvement found in the series by Mody *et al.*¹

The wrist score in a study by Mody and Meyers³ was 3.3 out of 5, which is still higher than our results of 2.48 for the left side and 2.73 for the right side, but not to the same extent as with the finger joints. If we compare our results with those of Belt *et al.*⁵ from Finland, the results for the wrist joint are more

or less the same – 2.5 on the Larsen scale for their series, 2.48 for the left wrist and 2.73 for the right wrist in our series. However, the Larsen score for the fingers (out of 100) shows a much bigger difference – 12.4 in their series compared with 9.65 on the left side and 10.32 on the right side in our series.

The possible value of the degree of total impairment is a value between 0 (no impairment) and 100 (most severe impairment). In Belt *et al.*'s series and our series the mean degree of total impairment is quite low on this scale (Belt *et al.* 12.4 and our series 9.65). Although we do not have sufficient information to do a statistical significance test, a difference of almost 3 on this scale, taking into account the relatively low standard errors and large sample sizes, probably indicates a tendency to less finger involvement and is not merely coincidental.

Conclusion

It seems that wrist involvement in black RA patients is similar to that in other population groups, while there is less finger joint involvement. We believe this has to be taken into account when interpreting the results of drug research on remission and disease-modifying properties. This knowledge will also help with planning of surgery – wrist surgery should be considered early in the disease.

References

1. Mody GM, Meyers OL, Reinach SG. Handedness and deformities, radiographic changes, and function of the hand in rheumatoid arthritis. *Ann Rheum Dis* 1989; **48**: 104-107.
2. Mody GM. Rheumatoid Arthritis in the Western Cape: A Clinical Study. MD thesis, University of Cape Town, 1987: 179.
3. Mody GM, Meyers OL. Rheumatoid Arthritis in blacks in South Africa. *Ann Rheum Dis* 1989; **48**: 69-72.
4. Larsen A, Dale K, Eek M. Radiographic evaluation of rheumatoid arthritis and related conditions by standard reference films. *Acta Radiologica Diagnosis* 1977; **18**: 481-491.
5. Belt EA, Kaarela K, Lehto MUK. Destruction and reconstruction of hand joints in rheumatoid arthritis. A 20-year follow-up study. *J Rheumatol* 1998; **25**: 459-461.

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