

Effect of Usage and Compliance of Hand Splints on Activities of Daily Living In Patients with Rheumatoid Arthritis: A Review

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ABSTRACT

Background: Rheumatoid arthritis is an inflammatory, systemic and autoimmune disease. Many of the deformities that occur with RA affect the ability to grip, pinch, and flex / extend the fingers and wrists, all compromising functional ability. This often leads individuals to adapt their daily activities or to stop doing different hobbies and activities altogether. As part of a comprehensive RA management, as well as other interventions, splints or orthoses are recommended to treat disease symptoms to help improve performance in daily activities. Nevertheless, several clinicians and physicians have found poor compliance with splint use in clinical practice.

Objective: This literature review aims to review the effect of usage and compliance of hand splints on activities of daily living in patients with rheumatoid arthritis.

Study Design: Literature Review

Significance: This review was done to investigate the rate of hand splint use and compliance in patients with RA. Because these two factors are defined as the main issue that interferes with treatment success and clinical outcomes in RA.

Method: An electronic database search was conducted using Google scholar, Science direct, Pub Med, Cochrane Library and reference lists from all retrieved articles.

Result & Discussion: The relationship between specific limitations and the use of adaptive devices could imply that the prescription of hand splint should preferably be limited to those patients who are currently or are likely to have impaired or limited device-related activity.⁵ 17 per cent of patients with immobilization splints were found to be most likely to be compliant, i.e. those who rested more than 2 hours a day – regularly used splints; on the other hand. 57 per cent of patients with activity splints used their splints on a regular basis. Rate of regular hand splint use was 36.6 percent. The cause of irregular hand splint use was splint discomfort in half of patients.

Conclusion: Compliance with the use of splints in the RA population has previously been studied in various studies. The compliance rate ranged from 25 percent to 65 percent. Unfortunately, the selection of patients has not been specified and predefined in the studies carried out so far. The results found to be not very reliable. Approximately half of RA patients had splints and 58 per cent of them were actually used. In addition to local complaints and general functional capability, the comfort of the splints is a major factor.

Key words: Rheumatoid arthritis, Hand splints, Compliance, Usage

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic inflammatory disease that affects joints and other tissues, with progressive damage to synovial joints resulting in bone

destruction. The hand is usually affected by RA and serious functional limitations may occur from an early stage.¹ It has been recorded that the prevalence of RA in adolescents ranged from 0.5 percent to 3.8

percent in females, and 0.15 to 1.37 percent in males.² The consequences of rheumatoid arthritis (RA) include many forms of disability, including various difficulties in performing ADLs.³ Hand function is an important aspect of ADL performance capability and other functional activities.⁴ Hand splints are often prescribed in patients with rheumatoid arthritis in order to improve or maintain the functional ability of the patient.^{5,6} Splints used while the patient is resting are believed to decrease inflammation and prevent contractures. And the splints used during activity support joints, thereby alleviating pain and improving function.⁷⁻⁹

There are a variety of splints available that tend to reposition the fingers neutrally to facilitate pinching and grasping,

they also enhance the biomechanical function of the rheumatoid hand.^{5,6}

METHOD

Various articles from following databases like Google scholar, Science Direct, Pub Med and Cochrane library were retrieved through a search by using keywords- Rheumatoid arthritis , Hand splints, Compliance, Usage, etc. Total 12 articles were included in the study and based on their findings a review was made.

RESULT

Total 12 articles were taken and studied. Out of which one was case study, one survey, one editorial paper, two literature reviews and seven were experimental studies. The details of the reviewed articles are tabulated in given table 1.

Table 1: Details of the reviewed articles

Author	Title	Conclusion
I.G. de Boer et al. 2009	Assistive devices: usage in patients with rheumatoid arthritis	Nearly 90 percent of RA patients have one or more assistive device options. Less than 23% of these devices were discontinued and the equipment and the processes were highly satisfied. Use factors vary among categories and include variables related to health status, device satisfaction or service satisfaction, and self-efficacy, apart from number of devices. ¹⁰
Martine M. Veehof, Erik Taal, Marjanne J. Willems, Mart A. F. J. van De laar 2008	Determinants of the Use of Wrist Working Splints in Rheumatoid Arthritis	The reasons why patients wear and not wear hand splints relate to the deliberate choices of patients that are based mainly on perceived advantages and barriers to wearing splints. The findings were used to establish awareness and therapeutic approaches for increasing compliance to splints. ¹¹
Ingeborg G. de Boer 2008	The usage of functional wrist orthoses in patients with rheumatoid arthritis	Approximately half of the RA patients had wrist splint, with 58 percent currently used. In addition to local complaints and general functional capability, satisfaction with the convenience of functional wrist splint is an important factor in their utilization. Such results indicate that additional research into modifiable compliance factors such as comfort and ease of use is required. ¹²
Ingrid Thyberg , Ursula A. M. Hass,Ulla Nordenskiöld, Thomas Skogh 2004	Survey of the Use and Effect of Assistive Devices in Patients With Early Rheumatoid Arthritis: A Two-Year Follow up of Women and Men	The use of ADs was associated with a severe condition and more serious disability that suggest that early AD intervention is necessary. ADs improved considerably daily work performance in both women and men. ³
Patricia J. Agnew, Frederick Maas, 1995	Compliance in Wearing Wrist Working Splints in Rheumatoid Arthritis	The perceived benefit of the splinting was established as the main compliance variable. Results show that participants appear to use their wrist splints more often with tasks that require more on the hands and wrists. Other factors affecting compliance seem to be related to the practical aspects of functioning wrist splints. ¹³
NancyJ.Callinan, Virgil Mathiowetz, 1995	Soft Versus Hard Resting Hand Splints in Rheumatoid Arthritis: Pain Relief, Preference, and Compliance	The findings show that resting hands are effective in pain relieving, and that people with rheumatoid arthritis may prefer soft splint to be used for this purpose. Customized splint prescription based on customer comfort and preference may increase wear compliance ¹⁴
Spoorenberg , Anneke Boers, Maarten van der Linden, Sjeff, 1994	Wrist Splints in Rheumatoid Arthritis: What Do We Know About Efficacy and Compliance?	Reducing the pain seems to be the most powerful splinting effect: it also seems to be the main reason for both prescribing and wearing splints. The effectiveness of splinting needs to be tested more closely with consistent quantification of joint results in controlled trials. We think compliance is strongly influenced by the views of the prescribing physician and the patient in the absence of hard evidence on the effectiveness of splinting for RA. ⁹

A. Spoorberg, M. Boers, S. Van der Linden 1994	Wrist Splints in Rheumatoid Arthritis A Question of Belief?	For controlled trials the effectiveness of splinting must be tested more thoroughly. In any case, rheumatologists and patients have to agree on the goals; reconsideration may be needed to prescribe immobilization splints outside the hospital. Standardized patient education and splint prescription is likely to help enhance compliance. For splints that are not used, performance can not be demonstrated. ⁸
Joan c. Rogers, Margo B. Holm, 1992	Assistive Technology Device Use in Patients With Rheumatic Disease: A Literature Review	A model were developed to predict patients who use or are not using ATDs recommended by occupational therapists, based on principles related to use of ATD defined from literature and clinical experience. The model's utilization will encourage an understanding of the factors which contribute to the use of the device and thus favor arthritis (ATD users) patients and treatment professionals (ATD prescriber). ¹⁵
Judy Feinberg, 1992	Effect of the Arthritis Health Professional on Compliance with Use of Resting Hand Splints by Patients with Rheumatoid Arthritis	Effective management of RA also includes drug therapy; forms of physical care such as exercise and splinting; and improvements in behaviors. Compliance with all these elements of the treatment program is likely to have a greater impact on the results of illness than any component. ¹⁶
Michael c. Belcon, R. Brian Haynes, and Peter Tugwell, 1984	A critical review of compliance studies in rheumatoid arthritis	The author has highlighted some of the many unresolved issues concerning the possible determinants of compliance in RA populations. ¹⁷
Thomas w. oaks , John R. Ward, Robert M. Gray, Melville R. Klauber, and Philip M. Moody, 1970	Family expectations and arthritis patient compliance to a hand resting splint regimen?	The use of the splint varies when it is assumed that one's family is expecting it to be used in comparison to that of a family that lacks expectations. Females were found to be more average than men, older people used it than younger, and the lower social classes in this case were more compliant than middle and upper class groups. ¹⁸

DISCUSSION

Splinting is significantly more successful in hand deformities in rheumatoid arthritis to improve and maintain the functional ability of the patient.¹⁹

Studies highlight the importance of the Assisting Device as compensation for activity limitation. Functional limitations and disease severity for predictive use have been identified. The relationship between specific limitations and the use of adaptive devices could imply that the prescription of assistive devices should preferably be limited to those patients who are currently or are likely to have impaired or limited device-related activity.¹⁰

In a previous study the average compliance rate was 73.8 percent (82.5 percent in the experimental group and 64.6 percent in the control group). This is more than recorded in other splint-compliance studies (25%-65%). Possibly, the relatively short period of follow-up and the fact that patients decided to engage in a research project and reported their compliance on a daily basis led to the unusually high degree of compliance.¹⁶

Pain relief is an important outcome indicator and a significant objective of arthritis treatment; it may therefore be more successful than other measures like

cleanliness and the appearance of the splint¹⁴

COMPLIANCE AND USAGE

Compliance issues in chronic disease treatment are well known and it has been reported that at least 50% of RA patients are non-compliant, irrespective of the nature of the intervention. Some find patient non-compliance a major problem in today's medical practice. Non-compliance results in an ineffective use of health services, whereas non-compliant patients are largely untreated and live in poor health. Compliance has been the subject of many investigators on hundreds of research projects. Nevertheless, there is a lack of well-controlled treatment studies to try to develop and assess approaches to enhance compliance.¹⁶

A number of factors can affect compliance with a rheumatic policy, patient awareness, patient-practitioner interaction, including rheumatic disease features and family physician expectations. In general, clients are more in accordance with a therapeutic scheme, when they immediately experience benefits and pain relief has consistently been identified as a factor that increases rheumatoid arthritis treatment.¹⁴

In relation to compliance, more than 200 variables were evaluated. These include patient social behavior, disease

characteristics, treatment procedures, the environment of health care and the relationship between patients and practitioners.²⁰

EFFECTIVENESS OF USAGE AND COMPLIANCE

Effective management of RA also includes drug therapy; forms of physical therapy, such as exercise and splinting programs; and changes in lifestyle. Compliance with all these aspects of the treatment program would likely have a more significant impact on disease outcomes than on any particular component.¹⁶

Females had found themselves more compliant than men on average, older people had more compliance than younger ones, and the lower social class subjects complied in this instance with more compliance than the middle and high social class classes.¹⁸

It has been found that the use of assistive devices significantly increases ADL capacity and reduces pain in RA patients.⁴

The perceived benefit of splint wear was concluded to be the most important determinant of splint usage, the expectations of the doctor and family followed and easy attachment by means of loops. It was also identified. In addition, patients tended to make more use of their splints with activities that demanded more on their wrist and hands. Appearance and discomfort of the splint did little to achieve adherence.¹¹

In studies focusing on the usage of assistive devices, the overall usage rate for assistive devices varied between 40% and 91%. It was found that the usage of assistive devices was associated with higher age, more severe disease, more disability and a beneficial effect or positive evaluation of the device. In these studies, a number of factors which are likely to be relevant for the actual usage of adaptive devices, such as the process of prescription and provision and the patient's evaluation of the design and comfort of adaptive devices, has not been taken into account.¹⁰

CONCLUSION

In the present review, we found that there are fewer studies available for the activity splint on compliance rates. 17 per cent of patients with immobilization splints were found to be most likely to be compliant, i.e. those who rested more than 2 hours a day – regularly used splints; on the other hand. 57 per cent of patients with activity splints used their splints on a regular basis. As far as the assessment of orthoses is concerned, an evaluation of the delivery process is important, along with a thorough assessment of the design.^{8,9} The compliance rate ranged from 25 percent to 65 percent.^{16,17} In their report, H.J. Rennie concluded that dynamic MCP splint has minimal interference with hand function and high patient acceptance.²¹

There were no studies that indicate to what extent arthritis patients follow a recommended splinting regimen. Both Bennett and Van Brocklin expressed concern about the issue that patients with arthritis may not wear their recommended splints but no attempt was made to assess how much splints were used.¹⁸

Rate of hand splint utilization was 36.6 percent. The cause of the use of irregular hand splint was discomfort in half of the patients with the splint. Compliance rate use of resting hand splint was low in patients with rheumatoid arthritis. The splinting effects on pain, global health status and hand functions are infinite.²²

LIMITATION:

- Design, type, and material used are not specified in the present study which is due to lack of specifications of various splints used in previous studies.
- Treatment protocol and specified prescription guidelines are indefinite due to less reliable evidence.
- True compliance values could not be assessed for a specific type of splint.

FUTURE ASPECTS

More experimental studies should be conducted to highlight usage and compliance of different types of hand splints on basis of following parameters:

- Gender as prevalence of RA in females is three times higher than males and nature of tasks performed by both the gender varies hugely.
- Predefined sampling techniques should be used, which is lacking primarily in studies done so far.
- Design of splint, type of splint, material used to fabricate splint should also be specified in future studies.

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