ORIGINAL ARTICLE

DO ARTHRITIC PATIENTS TALK MORE?

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Background: The modification of speech properties in patients may indicate a more profound pathology. Ample research has been undertaken in relation to different demographic and genetic factors on arthritis but significant research on speech in arthritis had not been conducted globally. The objective of this study was to investigate the effect of arthritis on the duration of speech in patients. **Method:** It was a randomised control trial conducted at Rehman Medical Institute (RMI), Peshawar, Pakistan between the months of July and August 2010. Two groups of patients were randomised prospectively; 50 arthritic and 50 non-arthritic, seen in an Orthopaedic OPD. Six standard history questions were asked from each patient and the duration of speech was recorded with the help of a stopwatch. A standard Performa was filled for each participant recording his/her personal information, duration of symptoms, time taken to answer the history questions and a brief past history. The Student's *t*-test was used to compare the mean durations of speech between arthritic and non-arthritic patients whilst the ANOVA test was applied to compare the mean durations of speech amongst the different forms of arthritis. Pearson's correlation test and odds ratio were also used to check the association of different quantitative and qualitative variables. **Results:** A statistically significant correlation was deduced in that arthritic patients talked more than non-arthritic ones ($p<0.001$). The other factors of age, sex, duration of symptoms and multiplicity of the pain had no influence on the time taken to talk. **Conclusion:** Arthritic patients speak for a significantly prolonged duration than non-arthritic ones.

Keywords: Arthritis, Osteoarthritis, Rheumatoid arthritis, Gouty arthritis, Speech, Pain

INTRODUCTION

The modification of speech properties in patients may indicate a more profound pathology. Laederach-Hofmann[1] showed that chest pain of angina pectoris was responsible for a significant variation of speech stylistics with greater silence latency, swallowed words and plosive words exhibited. Baylor[2] has demonstrated the effect of multiple sclerosis on speech behaviour. The study reveals multiple sclerotic patients to exhibit slurring of speech in a significant proportion. Disorders of speech can be classified under articulation, voice, rhythm and language. Godfrey and Ward[3] have emphasised the need to be alerted to such disorders as they are indicative of underlying nervous system abnormalities. Cinciripini and Floreen[4] have shown that chronic pain patients talk more when asked about pain experiences; such features of speech can facilitate disease diagnosis.

Ample research has been undertaken in relation to different demographic and genetic factors on arthritis but research on speech in arthritis had not been conducted globally. This study explores the hypothesis of the association between arthritis and speech disturbance by drawing a comparison between arthritic patients and non-arthritic disease groups.

MATERIAL AND METHODS

Two groups of patients were prospectively randomised; 50 arthritic and 50 non-arthritic patients viewed at an Orthopaedic OPD. Randomised computer generated numbers were used to choose both our arthritic patients and non-arthritic ones and the systemic random sampling technique was used for subject selection in both groups. The selection criteria were patients aged 15 years and above and arthritic patients having symptoms for more than 6 months. Patients with a psychiatric history and those who came for follow-up visits were excluded from the study. Incorporation of psychiatric patients would have biased the data as certain psychotic states are associated with patients talking excessively such as obsessive compulsive disorder and schizophrenia whilst in other cases patients often present with speaking less, e.g., social phobia or schizoid personality disorder. A set of the following six standard history questions were asked from each patient by an Orthopaedic Surgeon and the duration of speech in response to them was recorded.

- Where is the site of the pain?
- When did the pain start?
- How did the pain start?
- What aggravates it?
- What relieves it?
- Have you received any treatment prior to this?

The questions chosen were based on pain because it is often the chief complaint of arthritic patients and the reason why they seek medical attention. Pain is also a common symptom amongst non arthritic patients presenting within an orthopaedic clinic, thus both arthritic and non arthritic patients could be accounted for in a similar manner to a larger extent. However some patients presented with symptoms other

than pain for instance loss of sensation, as is a common presentation involving nerve lesions. In such cases the history questions were modified concerning the particular symptom presented. The structure of the questions was not changed. They proceeded in the same manner as the attributes of the pain symptom were questioned. Each patient was timed for the same number of questions. An effort was made to prohibit unwanted disruptions occurring during the course of the patient speaking. In the event that they occurred the watch was stopped and resumed when the patient started talking again about the specific question initially asked. The next question was not asked until the patient had stopped speaking fully. The pause interval was not timed that existed in the patient's speech between him/her finishing the answer and awaiting the next question to be asked. A standard digital stopwatch was used to time patients. A standard Performa was filled from each patient recording his/her name, age, duration of symptoms, time taken to answer the history questions and a brief past history.

Student's *t*-test was used to compare the mean durations of speech between arthritic and non-arthritic patients. For multiple comparisons of the different forms of arthritis, ANOVA was applied to compare the mean durations of speech. Pearson's correlation test and odd ratio were also used to asses the association of different quantitative and qualitative variables.

RESULTS

There were a total of a hundred patients; 50 arthritic and 50 non-arthritic. Among the arthritic patients the majority were osteo-arthritic (48%), followed by RA (28%) and gouty arthritic (24%). In the non arthritic group, the majority were those suffering from a fracture (30%) followed by those with sprains (28%), sciatica and carpal tunnel syndrome patients were represented in equal proportions of (12%). Those with disk deformities were represented by 8%, whilst individuals with ligament tears were 4%. The remainder 3 (6%) patients in the non arthritic sample were diagnosed as frozen shoulder, diabetic foot and a knee lump.

The age range in consideration of all patients was 15–80 years with a mean age of 42.5±16.4 years. The arthritic group was aged from 20–80 years with an average age of 49.8±14.0 years. The non-arthritic group was aged from 15–70 years with a mean age of 35.2±15.3 years.

The male to female ratio overall was 67% females to 33% males. In the non-arthritic population females comprised of 56% whereas in the arthritic group they constituted 78%. The total duration of speech for all hundred patients was 3510 seconds (58.5 minutes) with an average of 35.1±11.8 seconds. The range for the entire population was from 6–102 seconds. For arthritic patients the total time was 2526 seconds (42.1 minutes) with a range of 22–102 seconds and an average of 50.6±15.9 seconds. In the case of the non-arthritic group the total duration of speech for the 50 patients was 984 seconds (16.4 minutes) with an average of 19.6±7.6 seconds and a range of 6–48 seconds.

Upon drawing a comparison between arthritic and non-arthritic patients, results indicate that arthritic patients talk for a prolonged duration of time than non-arthritic ones and this difference appears to be significant.

Table-1 contains Mean±SD for arthritic and non-arthritic patients along with *p*-value. The observed *p*-value depicts that a significant variation exists in the duration of speech amongst both groups.

Table-1: Duration of speech (Mean±SD)

	Non-arthritic group Mean±SD	Arthritic group Mean±SD	*p*
Duration of speech (Sec)	19.65±7.665	50.56±15.915	<0.001

ANOVA was used to investigate the variation in duration of speech for different forms of arthritis. No significant variation in the duration of speech existed between the three arthritic groups of rheumatoid, gout and osteoarthritis (p=0.571). Our findings, in assessing the association between speech time and age in terms of patients with arthritis and those without arthritis revealed that no significant correlation existed between the two variables under the arthritic category (p=0.190). The same was the case under the non arthritic category where the *p*-value was 0.127.

For further exploration of patterns regarding the dependant variable, it was assessed in terms of the age of patients both in males and females under the two main disease groups. Since *p*-values were greater than 0.1 except for males with the arthritis (0.056), it was concluded that there was an insignificant correlation at the 10% level of significance between age and the duration of speech under the associated categories except for males with arthritis. This is to say that males with the condition are affected slightly in their speech time by age. Pearson correlation value of +0.59 indicating that speech time will increase with age for arthritic males at a probability of 10%.

Upon assessing the relation between the sex of patients and the time of their speech, a *p*-value comparison with a figure of 0.78 regarding the entire population indicated that an insignificant relationship existed between males and females. Further investigation under the arthritic category with a *p*-value of 0.31 depicted no correlation between the sexes. This was also the case for the non-arthritic group with a *p*-value of 0.16.

Within the arthritic group both poly- and mono-arthralgic patients were compared using *t*-test

with the end implication that there was insignificant difference between these two groups (p=0.18).

We also checked the association of sex with the frequency of arthritis patients, it was observed that a significantly higher number (58%) of females as compared to male (33%) have the disease. The observed odd ratio of 2.78 was significant with a 5% level of significance, it depicted that the odds of disease is 2.78 times higher for female as compared to male.

For arthritic patients we took the imperative to see if their prolonged duration of speech shared any association to the time period of their symptoms and we identified that it didn't. This was accomplished swiftly by a mere glance at the data figures in which we could not establish any apparent correlation. The data gave no inclination for arthritic patients with a prolonged duration of symptoms to be talking more or less. Figures readily contradicted each other and this deduction was comparable to the non-arthritic group too.

DISCUSSION

The study has proved the credential of the hypothesis to a large degree. Arthritic patients do talk more than non-arthritic ones. This derivation can be deduced if the pattern of results are examined which emphasised that a strong correlation existed between those group of patients with arthritis and the duration of their speech. Furthermore by nullifying the affect of other variables on the time taken to talk, the implication of our hypothesis has proven to be stronger. For instance the affect of sex was demonstrated to play no role in influencing the duration of speech, as was age. Although age had an affect on arthritic males, this was only at a significance level of 10% and does not interfere with the strength of our hypothesis as 90% of arthritic males still displayed no relation to age having an influence on their speech time.

We also excluded the multiplicity of the pain in affecting our measured variable, i.e., mono-arthralgic patients were shown to be indifferent of poly-arthralgic patients in the duration of their speaking. In addition our study also revealed for no relationship to exist between the time period of symptoms and the time taken to talk, thus exemplifying the etiological factor for difference in speech between non-arthritic and arthritic patients to have a stem from the disease.

The limitation of our study is the small number of patients sampled; however, this does not reduce the significance of our finding as it is new and prospective. Furthermore, it can be easily conducted by those willing to re-establish the findings gathered.

CONCLUSION

Arthritic patients speak for a significantly prolonged duration than non-arthritic ones. Further studies are needed to evaluate and explore this strange correlation and identify the aetiology. In addition, optimistically one can hope for manipulating the relationship to employ it for therapeutic purposes. Perhaps it should be investigated what effect prolonged speech is having and whether its intervention can help alleviate symptoms such as fatigue amongst arthritic patients. Most importantly, this prolonged duration of speech can be used to facilitate diagnosis in the clinic.

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