Seasonal Admission Rates of Geriatric Patients with Musculoskeletal Problems to Physical Therapy and Rehabilitation Clinics

Zübeyir Sarı [1], Saadet Ufuk Yurdalan [1], Mine Gülden Polat [1], Bahar Özgül [1], Ayfer Kanberoğlu [2], Selma Önel [3]

[1] Marmara University Faculty of Health Sciences Department of Physiotherapy and Rehabilitation, Istanbul
[2] Duygu Private Hospital, Istanbul
[3] Burcu Private Physiotherapy Branch Centre, Istanbul

Abstract
Seasonal variations in the admission rates of geriatric patients with musculoskeletal problems to physical therapy and rehabilitation clinics were examined in this study. Totally 2257 patients (1802, 79.84% female; 455, 20.16% male) over the age of 65 years (mean age 72.32±5.67years) who were admitted to Duygu Private Hospital and Burcu Private Physical Therapy Branch Center in Istanbul were included. Monthly admissions and seasonal distribution were retrospectively calculated for 2 years. Admission rates of females were higher than for males in all seasons; females presented mostly in spring (33.1%), whereas males presented mostly in autumn (30.3%). Examination of monthly and seasonal admission identified gender-based differences according to months (p=0.007) and seasons (p=0.018). Monthly and seasonal admission rates according to age groups showed similar distribution of monthly (p=0.406) and seasonal (p=0.327) admissions. These findings suggest that, due to climatic conditions in Istanbul, seasons with significant temperature changes affected musculoskeletal symptoms and that future studies should further analyze this subject.

Key words: Geriatrics, musculoskeletal diseases, physical therapy, seasonal variation

(Rec.Date: *Sep 16, 2012* - Accept Date: Dec *08, 2012*)

Corresponding Author*:* Zübeyir Sarı, Marmara University, Health Sciences Faculty Physiotherapy and Rehabilitation Department, E-5 Crossroad, Cevizli - Kartal/ İstanbul
Tel: +90216 399 93 71 /1145 Fax: +90216 399 62 42
E-mail: fztzubeyir@yahoo.com

Introduction

Old age refers to the period that slowly begins after adulthood and proceeds during the life-time. During this period, certain physiological, biological and functional disabilities and changes occur in body systems. These changes in body systems, decreased activity level, imbalanced diet and deficiency in exercise habits, along with ageing, cause a reduction in the functional capacities of elderly people and have a negative impact on the independence and everyday activities of elderly individuals [1].

Chronological ageing and biological ageing mostly progress at different speeds. Individual differences are observed among the most important factors in the ageing process. These differences are determined by gender, lifestyle, occupation, dietary habits, medical history, social life and personality traits. Apart from these factors, it is known that the speed of ageing differs in some regions; the rate of ageing is particularly pronounced in regions with high chemical pollution.

Increasing average life expectancy in developed countries results in a proportional increase in elderly populations. It is envisaged that the elderly population will double within the next 20 years [2].

Physical problems that significantly affect the speed of aging, quality of life and independence of a person should be prevented, or otherwise immediately addressed. Preventative health services and direct health policies are becoming more important. Determination of the periods affecting physical problems will contribute to the planning of related health policies.

This study examined seasonal variations in the admission of geriatric patients with musculoskeletal problems to physical therapy and rehabilitation clinics.

Material and Methods

The study included 2257 patients (1802, 79.84% female; 455, 20.16% male) over the age of 65 years (mean age 72.32±5.67 years) who were admitted to Duygu Private Hospital and Burcu Private Physical Therapy Branch Center in Istanbul, Turkey.

Monthly patient admissions and seasonal distributions were retrospectively calculated for 2 years, over a total of 24 months, between 2007 and 2009.

The study adopts a descriptive methodology. Data was analyzed using SPSS (version 11.5) for Windows. The chi-square test was used to compare categorical variables (gender, age groups, referred month and referred season). Statistical significance was analyzed at $p<0.05$.

Results

The number of monthly applicants and percentages of 1802 female (79.8%) and 455 male (20.2%), totally 2257 subjects whose age range was 65-97 years and mean age was 72.32±5.67 and who applied to Duygu Private Hospital and Burcu Private Physical Therapy Center in İstanbul, retrospectively for the last two years (January 2007-December 2009) and total distribution according to four seasons were analyzed. Monthly and seasonal distribution of cases by gender and age groups were shown in Table 1 and 2, respectively. Top ten diagnosis of our patients were; spondylosis, arthritis/arthrosis, intervertebral disc disorders, osteoporosis, shoulder problems, joint disorders, polyneuropathies, hemiplegia, synovitis/tenosynovitis and rheumatoid arthritis.

Both of male and female groups applied to the clinic for all months; the highest proportions of female applicants were seen in April (12.4%), compared with November (11.2%) for males. Analysis of the monthly admittance data showed differences according to gender ($p=0.007$, Table 1).

When the distributions of cases by gender were examined according to seasons for physical therapy and rehabilitation clinics, application of females was higher than application of males during all four seasons; females applied mostly in spring (33.1%), whereas males applied mostly in autumn (30.3%). When the distribution of the applications was examined by season, there was difference according to gender ($p=0.018$, Table 2).

When monthly referrals to physical therapy and rehabilitation clinics were examined according to age groups, there were similar application rates for all age groups ($p=0.406$, Table 1) and seasonal application rates were similar according to age groups ($p=0.327$, Table 2).

Discussion

Studies within the literature present conflicting conclusions on whether the severities of various systematic problems vary according to weather conditions. A review of the literature revealed that general symptoms of diseases such as rheumatoid arthritis, osteoarthritis and

fibromyalgia varied according to weather conditions [3-9]. Some studies carried out more specific analyses and found that different weather conditions caused a change only in rheumatoid arthritis [10-12], only in fibromyalgia [8,12] or only in back pain [3,14] cases. Conversely, other studies reported that weather conditions had no effect on the symptoms of rheumatic diseases [15-19]. Although methods of evaluation varied, all of the reviewed studies sought to answer the same question. There is no consensus within the literature about whether there is a significant relationship between weather conditions and symptoms of musculoskeletal and rheumatic diseases.

Table 1: Monthly distribution of cases by gender and age groups.

Referral	**Gender**				**Age Groups**						**Total**	
Month	**Female**		**Male**		**65-69**		**70-74**		**75 & ↑**			
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
January	143	7.9	21	4.6	66	7.5	52	8.4	46	6.1	164	7.3
February	121	6.7	37	8.1	60	6.8	46	7.5	52	6.9	158	7.0
March	173	9.6	42	9.2	77	8.7	66	10.7	72	9.5	215	9.5
April	223	12.4	39	8.6	101	11.4	71	11.5	90	11.9	262	11.6
May	200	11.1	40	8.8	86	9.7	63	10.2	91	12.0	240	10.6
June	159	8.8	37	8.1	70	7.9	63	10.2	63	8.3	196	8.7
July	126	7.0	30	6.6	55	6.2	45	7.3	56	7.4	156	6.9
August	107	5.9	38	8.4	58	6.6	33	5.3	54	7.1	145	6.4
September	118	6.5	45	9.9	71	8.0	36	5.8	56	7.4	163	7.2
October	170	9.4	42	9.2	100	11.3	54	8.8	58	7.7	212	9.4
November	153	8.5	51	11.2	77	8.7	57	9.2	70	9.2	204	9.0
December	109	6.0	33	7.3	62	7.0	31	5.0	49	6.5	142	6.3
Total	**1802**	**79.8**	**455**	**20.2**	**883**	**39.1**	**617**	**27.3**	**757**	**33.5.0**	**2257**	**100.0**

Our study revealed that musculoskeletal and rheumatic symptoms were affected depending on seasons when there were temperature changes in the local climatic conditions of Istanbul. This finding suggests that the severities of musculoskeletal and rheumatic diseases vary according to weather conditions.

Table 2: Seasonal distribution of cases by gender and age groups.

Referral	**Gender**				**Age Groups**						**Total**	
Season	**Female**		**Male**		**65-69**		**70-74**		**75 & ↑**			
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Autumn	441	24.5	138	30.3	248	28.1	147	23.8	184	24.3	579	25.7
Winter	373	20.7	91	20.0	188	21.3	129	20.9	147	19.4	464	20.6
Spring	596	33.1	121	26.6	264	29.9	200	32.4	253	33.4	717	31.8
Summer	392	21.8	105	23.1	183	20.7	141	22.9	173	22.9	497	22.0
Total	**1802**	**79.8**	**455**	**20.2**	**883**	**39.1**	**617**	**27.3**	**757**	**33.6**	**2257**	**100.0**

A review of the literature found no previous studies based on the relationship between admissions to physical therapy and rehabilitation clinics and seasons, without making a distinction between diseases, and which only included geriatric patients.

We believe that it would be useful to conduct similar studies in cities with different climatic conditions, and that this subject should be analyzed in further detail.

References

1. Ergun N. Fiziksel Yönleri ile Sağlıklı Yaşlanma. "Sağlıklı Yaşlanma" Uluslararası Hemşireler Birliği 1992 Teması Sempozyum Kitabı, Ankara, 26-27 Kasım 1992:18-30.
2. Ferreira MT, Matsudo SMM, Ribeiro MCSA, Ramos LR. Health-related factors correlate with behavior trends in physical activity level in old age: longitudinal results from a population in São Paulo, Brazil. BMC Public Health. 2010;10:690. doi: 10.1186/1471-2458-10-690
3. Wolfe F, Hawley DJ, Cathey MA, Caro X, Russell IJ. Fibrositis: symptom frequency and criteria for diagnosis. J Rheumatol. 1985;12:1159-63.
4. Guedj D, Weinberger A. Effect of weather conditions on rheumatic patients. Ann Rheum Dis. 1990;49(3):158-9. doi:10.1136/ard.49.3.158.
5. Nyberg G, Nyberg A. Weather forecasting in rheumatic disease. Arch Met Geoph Biocl. 1984;34:267-72. doi:10.1007/BF02265492.
6. Smedslund G, Mowinckel P, Heiberg T, Kvien TK and Hagen KB. Does the weather really matter? A cohort study of ınfluences of weather and solar conditions on daily variations of joint pain in patients with rheumatoid arthritis. Arthritis & Rheumatism. 2009;61(9):1243-7.
7. Hawley DJ, Wolfe F, Lue FA, Moldofsky H. Seasonal symptom severity in patients with rheumatic diseases: a study of 1,424 patients. J Rheumatol. 2001;28(8):1900.
8. Miranda LC, Parente M, Silva C, Clemente-Coelho P, Santos H, Cortes S, Medeiros D, Ribeiro JS, Barcelos F, Sousa M, Miguel C, Figueiredo R, Mediavilla M, Simões E, Silva M, Patto JV, Madeira H, Ferreira J, Micaelo M, Leitão R, Las V, Faustino A, Teixeira A. Perceived pain and weather changes in rheumatic patients. Acta Reumatol Port. 2007;32(4):351-61.
9. Strusberg I, Mendelberg RC, Serra HA, Strusberg AM. Influence of weather conditions on rheumatic pain. J Rheumatol. 2002;29(2):335-8.
10. Patberg WR, Nienhuis RLF, Veringa F. Relation between meteorological factors and pain in rheumatoid arthritis in a marine climate. J Rheumatol. 1985;12:711-5.
11. Iikuni N, Nakajima A, Inoue E, Tanaka E, Okamoto H, Hara M, Tomatsu T, Kamatani N, Yamanaka H. What's in season for rheumatoid arthritis patients? Seasonal fluctuations in disease activity. Rheumatology. 2007;46:846-8. doi:10.1093/rheumatology/kel414.
12. Drane D, Berry G, Bieri D, McFarlane AC, Brooks P. The association between external weather conditions and pain and stiffness in women with rheumatoid arthritis. J Rheumatol. 1997;24(7):1309-16.
13. Hagglund KJ, Deuser WE, Buckelew SP, Hewett J, Kay DR. Weather, beliefs about weather, and disease severity among patients with fibromyalgia. Arthritis Care Res. 1994;7(3):130-5. doi:10.1002/art.1790070306.

14. McGorry RW, Hsiang SM, Snook SH, Clancy EA, Young, SL. Meteorological conditions and self-report of low back pain. Spine. 1998;23(19):2096-102. doi:10.1097/00007632-199810010-00011.
15. Sibley JT. Weather and arthritis symptoms. J Rheumatol. 1985;12:707-10.
16. Wilder FV, Hall BJ and Barrett JP. Osteoarthritis pain and weather. Rheumatology. 2003;42:955-8. doi:10.1093/rheumatology/keg264.
17. De Blécourt ACE, Knipping AA, De Voogd N, Van Rijswijk MH. Weather conditions and complaints in fibromyalgia. J Rheumatol. 1993;20:1932-4.
18. Fors EA, Sexton H. Weather and the pain in fibromyalgia: are they related? Ann Rheum Dis. 2002;61(3):247-50. doi:10.1136/ard.61.3.247.
19. Redelmeier DA, Tversky A. On the belief that arthritis pain is related to the weather. Proc Natl Acad Sci. 1996;93(7):2895-6. doi:10.1073/pnas.93.7.2895.