Clinical and Experimental Rheumatology 2001; 19: 447-450.

A comparative study of outcome in myositis and other musculoskeletal disorders assessed using the Nottingham Health Profile

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Received on March 13, 2000; accepted in revised form on December 20, 2000.

Key words: Polymyositis, dermatomyositis, Nottingham Health Profile, health status.

ABSTRACT

Objective

This study evaluated the comparative impact of myositis and other musculo - skeletal disorders on general health using the Nottingham health profile (NHP) as a generic measure of health status.

Methods

A prospective observational study of 113 females with myositis, 142 females with rheumatoid arthritis, 45 females with spinal osteoporosis and 96 fe - males with knee osteoarthritis.

Results

All mean NHP section scores were higher in myositis and other musculo - skeletal disorders compared to popula - tion mean values. Section scores for energy and social isolation were high in myositis compared to all other disor - ders. Scores for physical disability in myositis were similar to RA. Pain scores were higher in RA and OA com - pared to myositis.

Backwards linear regression models explained 26-42% of the variation in energy and social isolation scores. Emotion and physical section scores were the major determinants and the pattern was similar in all disorders. Di - sease duration and age had little effect.

Conclusions

Myositis is not simply a disease with physical problems but has wide rang - ing effects on social and emotional well being. Until disease-specific instru - ments are available, a generic measure like the NHP can be used to assess problems other than muscle pain and loss of strength.

Introduction

Patients with inflammatory myositis, classified as polymyositis or dermatomyositis, have muscle pain and weakness that severely disrupt their everyday activities. Conventional clinical assessments concentrate on measuring muscular strength and damage and do not assess how myositis affects overall health. There is very little data available on the affect of myositis on health status, in contrast to the extensive information available in other inflammatory systemic musculoskeletal diseases, especially rheumatoid arthritis (RA) (1) and, to a lesser extent, systemic lupus erythematosus (SLE) (2).

Measuring health status in rheumatic diseases has conventionally used disease-specific questionnaires to assess disability; for example the Health Assessment Questionnaire (3). An alternative approach is to use generic health status measures. There are several types of these. Some provide a single global score of well being (health indices), for example the EuroQol (4). Others measure different dimensions of health status (health profiles). Examples include the Nottingham Health Profile (NHP), the SF-36, the Sickness Impact Profiles (6), the Functional Limitations Profile (7) and the McMaster health index (8). Health profiles allow comparison of health status across diseases, although they are less sensitive than disease-specific measures.

We evaluated the impact of established myositis on general health using the NHP as a generic measure of health status. We compared the findings in myositis with data from patients with rheumatoid arthritis (RA), osteoporosis (OP) and osteoarthritis (OA). To control for the complex interactions between sex and health status we only studied females.

Patients and methods

Myositis cases

Patients had a diagnosis of polymyositis or dermatomyositis which was categorised in relation to conventional criteria (9). All had had myositis for at least 6 months and had been treated at a specialist unit using conventional therapies (steroids and immunosuppressive drugs). These cases were recruited with the help of the Polymyositis and Dermatomyositis Support Group, an independent national support group for people with myositis and their families. NHP questionnaires were sent to all myositis cases registered with the support group. The response rate was 60%. We subsequently excluded males, children and patients with a diagnosis of juvenile dermatomyositis and inclusion body myositis from further analysis. There were 57 patients with dermatomyositis (DM) of mean age 50 years

(range 25-75 years) and of mean disease duration 7 years (range 1 -26 years) and 56 with polymyositis of mean age 54 years (range 22-76 years) and of mean disease duration 7 years (range 1-25 years).

Other musculoskeletal disorders

We studied three other groups of females with rheumatoid arthritis (RA), spinal osteoporosis (OP) and osteoarthritis (OA). They all met conventional diagnostic criteria and were consecutive clinic attendees with these conditions. They comprised: 142 patients with RA of mean age 59 years (range 24-87 years) and of mean disease duration 10 years (range 1-45 years); 45 cases with spinal osteoporosis (OP) of mean age 67 years (range 43-85 years) and of mean disease duration 13 years (range 1-40 years); and 96 patients with knee osteoarthritis of mean age 63 years (range 41-81 years) and of mean disease duration 10 years (range 1-40 years).

Population mean values

These were taken from published surveys of 890 healthy subjects (10) and 1,976 patients with common diseases (musculoskeletal, respiratory, cardiovascular and mental health problems) (11).

Health profile measures

All patients completed the NHP. This has 38 statements (answered 'yes' or 'no') which assess subjective distress in six sections: physical mobility (8 questions), pain (8 questions), sleep (5 questions), emotional reactions (9 questions), social isolation (5 questions) and energy level (3 questions). Scores for each section range from 0 (no problem) to 100 (all problems listed are present).

Statistical analysis

Means and standard deviations were used for summary statistics. Groups were compared using Kruskal-Wallis one way analysis of variance and the Mann-Whitney U test. Backwards linear regression was undertaken using SPSS software with 0.10 as the limiting statistic.

Results

Mean NHP section scores (Table I) show that all of the mean NHP section scores were higher in myositis and other musculoskeletal disorders compared to the population mean values for healthy controls and patients with common diseases. The scores were compared across all groups by Kruskal-Wallis one-way ANOVA and between myositis cases and other individual musculoskeletal disorders by Mann Whitney U tests. The main findings were that section scores for energy and social isolation were high in myositis compared to all other disorders, that scores for physical disability in myositis were similar to RA and were higher than in OA and OP, and that pain scores were higher in both RA and OA compared to myositis.

We further evaluated the differences in mean NHP section scores between polymyositis and dermatomyositis by Mann Whitney U Tests. The only significant difference was in physical disability, where scores were higher in polymyositis. Scores in the other 5 sections were similar.

Backwards linear regression models were used to analyse the factors contributing to energy and social isolation scores of the NHP in myositis and the other musculoskeletal disorders (Tables II and III). The models examined the

Table I. NHP section scores in myositis cases (dermatomyositis and polymyositis) and other musculoskeletal disorders.

Diagnosis		Energy		Pain		Emotion		Sleep		Social		Physical	
	Number	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Control data													
Healthy subjects	890	13.5	-	6.2	-	10.4	-	16.4	-	6.9	-	6. 7	
Common diseases	1976	21.1	-	10.8	-	13	-	18.3	-	7.0	-	6.4	
Myositis													
All cases	113	73.8	34.5	30.3	31.7	25.1	28.0	28.0	28.1	25.1	28.1	41.8	26.4
DM	57	73.5	33.7	29.8	30.8	27.9	30.3	25.8	28.6	25.5	28.6	36.5	24.0
PM	56	74.0	35.7	30.9	32.8	22.3	25.4	30.2	27.8	24.6	27.7	47.1	27.9
DM vs PM[1]		NS		NS		NS		NS		NS		0.03	
Other musculoskeletal disorders													
RA	142	49.6	40.9	49.0	34.0	27.7	27.2	32.3	30.7	15.8	21.5	39.5	27.2
OP	45	32.1	38.8	33.2	35.7	12.8	16.4	30.5	32.5	11.3	14.5	21.7	22.6
OA	96	43.2	37.7	41.1	27.1	14.0	19.0	31.7	26.8	10.8	18.7	27.4	23.2
Other musculoskeletal disorders vs myositis[2]		0.00001		0.0001		NS		NS		0.0001		0.0003	
RA vs myositis[1]		0.00001		0.00001		NS		NS		0.007		NS	
OP vs myositis[1]		0.00001		NS		0.02		NS		0.008		0.00001	
OA vs myositis[1]		0.00001		0.002		0.007		NS		0.0002		0.0001	

[1] Mann-Whitney U test; [2] Kruksal Wallis one-way ANOVA.

Table II. Backwards regression analysis of factors contributing to energy levels in myositis, OA, OP and RA.

Variable	Myositis			OA			OP			RA		
	B	95% CI	Signif	B	95% CI	Signif	B	95% CI	Signif	B	95% CI	Signif
Physical	0.46	0.23,0.68	0.0001	0.75	0.46, 1.03	0.00001	0.68	0.22, 1.34	0.005	0.35	0.09,0.61	0.01
Emotion	0.32	0.12, 0.53	0.0023	0.32	-0.03, 0.67	0.08	0.88	0.24, 1.51	0.008	0.30	0.04, 0.57	0.03
Pain	0.20	0.02, 0.38	0.0287	Not in equation			Not in equation			0.27	0.06, 0.49	0.014
Sleep	Not in equation			0.31	0.06, 0.56	0.018	Not in equation			0.20	-0.02, 0.42	0.07
Multiple R	0.62			0.67			0.66		0.66			
Adjusted R^2	0.36			0.42			0.41		0.41			

Note: Social isolation, disease duration and age were not in the equation.

Table III. Backwards regression analysis of factors contributing to social isolation in myositis, OA, OP and RA.

Variable	Myositis			OA			OP			RA		
	B	95% CI	Signif	B	95% CI	Signif	B	95% CI	Signif	B	95% CI	Signif
Physical	0.15	-0.03, 0.31	0.07	0.20	0.06, 0.34	0.006	0.17	-0.02, 0.36	0.08	0.18	0.04, 0.31	0.012
Emotion	0.58	0.43, 0.74	0.00001	0.49	0.32, 0.66	0.00001	0.34	0.07, 0.60	0.013	0.29	0.15, 0.43	0.00001
Multiple R	0.65			0.63			0.55			0.66		
Adjusted R^2	0.41			0.39			0.27			0.41		

Note: Energy, pain, sleep, disease duration and age were not in the equation

contributions of other components of the NHP together with disease duration and age. Overall these models explained between 26-42% of the variation. They showed that energy levels in myositis, OA,OP and RA are related to physical and emotional domains, that in myositis and RA they are also related to the pain domain, and that in RA the sleep domain has an additional influence (Table II). They also showed that social isolation is related to physical and emotional domains in myositis, OA,OP and RA (Table III). Disease duration and age did not contribute to the variation seen in any of the conditions.

Discussion

The health profiles of patients with myositis show higher section scores for energy, physical mobility and social isolation that other musculoskeletal diseases. Physical mobility scores were higher in polymyositis cases than dermatomyositis. Studies using NHP, SF-36 and EuroQol have shown that generic health status measures give reasonable estimates of disease activity and outcome in RA (12,13) and SLE (14) but the impact of myositis on these generic instruments has not been previously reported. We have found the NHP gives a realistic assessment of these cases . However, there are some limitations; for example, the NHP has “floor” and “ceiling” effects and the short-term response of the NHP to treatment is unknown. In some circumstances it could create a false picture (12), for example social isolation may have many causes other than myositis. The use of yes/no responses may also reduce the sensitivity of the NHP (l5).

We specifically excluded patients with acute myositis as they are difficult to identify, are usually very unwell and would be expected to have high measures in many of the NHP domains. The cases with established myositis we studied, whose average disease duration was 7 years and included patients with up to 26 years of disease, had persistently abnormal health status involving most domains. Interestingly, not only were energy levels very abnormal in myositis, but it is likely that they would have been far higher than those with RA and other musculoskeletal disorders if there had not been a ceiling effect with the NHP. This suggests a specific problem with energy levels exists in myositis.

The backwards linear regression model showed that emotion and physical function scores were the main determinants of social isolation and energy levels in all the diseases and that there were no specific changes in myositis. Interestingly, disease duration, age and sleep did not contribute to the variation seen any of these conditions. The implication is that there are no disease specific effects of myositis on health status and this strengthens the case for using generic outcome measures to compare different musculoskeletal disorders.

The use of health profiles shows that myositis is not simply a disease with physical problems (mobility, energy and pain), but has wide ranging effects on social and emotional well being, similar to those in RA. Further research is needed to examine the health status of myositis patients,and in particular to look at fluctuations in the disease with therapy and the impact this has on patients. The floor and ceiling responses of the NHP suggest a disease-specific health status assessment would have advantages and this needs to be developed. Until disease specific instruments are available, a generic measure like the NHP can be used to assess problems other than muscle pain and loss

of strength. Our findings underline the severe impact of myositis on many aspeots of everyday life when compared to other musculoskeletal diseases.

Acknowledgements

YLC would like to thank the Dermatomyositis and Polymyositis Support Group for their financial and technical support. HLM would also like to thank the King's College Joint Research Council for financial support.

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