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Journal of Cystic Fibrosis 8 (2009) 425–427

Journal of Cystic Fibrosis

www.elsevier.com/locate/jcf

Short communication

An exploratory study investigating factors associated with adherence to chest physiotherapy and exercise in adults with cystic fibrosis

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Received 16 February 2009; received in revised form 20 July 2009; accepted 5 August 2009
Available online 22 September 2009

Abstract

This study explored the relationship between psychological and demographic variables relating to chest physiotherapy (CP) and exercise in adults with cystic fibrosis. The main results were that adherence to both treatments was low and analysis of variance indicated that severity and gender were associated with exercise adherence, importance and burden. These results suggest potential areas for interventions to improve exercise adherence.

Keywords: Adherence; Chest physiotherapy; Exercise; Importance; Burden

1. Background

Poor treatment adherence is well recognised and approximately 50% of people with chronic conditions do not adhere to treatment [1] and adherence reduces with the complexity of treatment [2]. Good adherence to various aspects of treatment is an important part of most chronic illnesses [1]. This is especially the case for cystic fibrosis (CF), as people with CF are required to undertake a complex regimen of therapies: usually daily chest physiotherapy (CP) and exercise to clear secretions from the lungs, enzymes/vitamin supplements to ensure adequate nutrition, oral and nebulised medication to assist lung function [3] and in some cases nocturnal ventilation and feeding by gastronomy [4]. Studies have indicated that adherence to various treatments varies with different aspects of the CF regimen [4–6]: For example, an adult sample self-reported varying levels of adherence for 13 treatments, the highest being 94.3% for pancreatic enzymes and the lowest being dietary supplements at 43.3% [6]. As well as CF being treated with a complex treatment schedule, it places a high burden on patients. To highlight this, recently adults with CF reported a median of 7 daily therapies and spending 108 min daily on treatments [7].

Previous studies have found that adherence to CP and exercise is lower than other treatments [e.g. 5]. However, both therapies are seen as integral parts of CF treatment [9,10]. This study is a preliminary investigation exploring potential relationships between adherence to both CP and exercise and treatment importance, treatment burden, perceived CF severity and demographic variables.

2. Methods

Questionnaires were sent to everyone over 18 years with CF on the UK's Cystic Fibrosis Trust mailing list. Ethics approval was obtained through the University of Southampton. There were 563 respondents (39.8% response rate), who replied anonymously, mean age 27.85 years, range 18 to 66; 310 females and 253 males.

Participants were asked to rate CP and exercise for importance on a 6-point scale. Burden was measured by asking how troublesome they found each treatment on a 4-point scale and adherence was rated on a 5-point scale: 1 (never), 2 (hardly ever), 3 (sometimes), 4 (almost always) and 5 (always). Participants indicated whether CP and exercise were part of

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doi:10.1016/j.jcf.2009.08.005

their current personal routine and rated severity of their CF. Content analyses of information from these participants about CP and exercise reported elsewhere [8] strongly suggests that participants understood the differences between CP and exercise.

3. Results

A high number of participants reported that CP and exercise were part of their current routine ($N=528$; $N=545$, respectively). However, the levels of reporting being "always adherent" were low (CP=29.5%; exercise=24.2 %), although importance of both treatments was considered fairly high (CP, mean=4.89, sd 1.36; exercise, mean=4.99, sd 1.33). Burden was considered fairly high for CP (mean=2.93, sd 1.00) but slightly lower for exercise (mean=2.00, sd 1.01).

Analyses were Pearson correlations, analysis of variance and chi square. Importance and burden were positively correlated (CP, $r=0.21$, $p<.01$; exercise, $r=0.31$, $p<.01$). Age was not correlated with any variable.

Males compared to females rated exercise adherence as significantly higher and more important and less of a burden. There were no significant gender differences for CP (see Table 1).

Perceived severity was divided by median split into high and low. For exercise, individuals rated as high severity scored significantly lower on adherence and importance but significantly higher on burden, For CP, individuals rated as high severity scored significantly higher on adherence, importance and burden (see Table 2). Chi square indicated no gender differences for severity ($\chi^2=0.58$, $df=1$, ns).

3. Conclusions

Similar to previous studies, adherence to CP and exercise was low e.g. [5]. As self-report measures of adherence tend to be overestimated [1], adherence was probably even lower. Other potential limitations are reported elsewhere [8].

Females with CF have a lower life expectancy than males [10] As females reported lower exercise adherence, believing it to be less important and more of a burden than males, it is important that future studies should investigate any possible link between these gender differences in exercise adherence and life expectancy.

It is not surprising that people with self-reported severe CF find CP and exercise a burden if their health is not good. Their reporting high CP adherence but low exercise adherence has potential clinical relevance, especially as they reported that CP is important but exercise is not. It would be useful in future studies to have an objective measure of severity (e.g. lung function) as well as a subjective measure.

These results concerning exercise, severity and gender are preliminary findings which warrant further study, with the aim of understanding this relationship more fully, taking into consideration the wider literature on gender differences and developing interventions to improve exercise adherence.

Table 1
Mean and standard deviations for adherence, importance and burden for exercise and cp for males and females.

	Gender		*F* value
	Males	Females	
Exercise			
Adherence	3.64 (1.13)	3.37 (1.11)	$F(1, 543)$ 7.80 **
Importance	5.18 (1.13)	4.83 (1.19)	$F(1, 543)$ 11.74 ***
Burden	1.73 (1.97)	2.09 (2.25)	$F(1, 536)$ 10.79 ***
CP			
Adherence	3.03 (1.43)	3.22 (1.44)	$F(1, 526)$ 2.40
Importance	4.82 (1.37)	4.94 (1.35)	$F(1, 498)$ 1.04
Burden	2.82 (1.97)	2.85 (2.25)	$F(1,493)$ 0.07

** $p<.005$.
*** $p<.001$.

Table 2
Means and standard deviations for adherence, importance and burden for exercise and CP for high and low severity.

	Severity		*F* value
	High	Low	
Exercise			
Adherence	3.21 (1.14)	3.73 (1.06)	$F(1, 543)$ 30.77 ****
Importance	4.83 (1.17)	5.12 (1.17)	$F(1, 496)$ 8.10 **
Burden	2.26 (1.07)	1.79 (0.89)	$F(1, 496)$ 29.73 ****
CP			
Adherence	3.38 (1.35)	2.92 (1.46)	$F(1, 526)$ 13.53 **
Importance	5.04 (1.35)	4.75 (1.36)	$F(1, 496)$ 5.72 *
Burden	2.93 (1.02)	2.74 (0.98)	$F(1, 496)$ 4.49 *

* $p<.05$.
** $p<.005$.
**** $p<.0001$.

Acknowledgements

The author wishes to thank Sandra Horn for helping to design the study and the Cystic Fibrosis Trust for their help in contacting the participants.

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