A longitudinal study of health-related quality of life, fatigue and physical activity in chronic kidney disease patients

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Abstract

This study assessed the health-related quality of life (HRQoL), fatigue and physical activity levels of 28 persons with chronic kidney disease (CKD) on initial administration of an erythropoietin stimulating agent to increase haemoglobin levels, and at 3 months, 6 months and 12 months. The sample comprised of 15 females and 13 males whose ages ranged from 31 to 84 years. One-way Repeated measures ANOVAs indicated a significant improvement over time for SF-36 scales of role physical, vitality, emotional well-being and overall mental health. There was a significant difference in fatigue levels over time [$F(3,11) = 3.78$, $p<.05$]. Fatigue was highest at baseline and lowest at 6 months. The more breathlessness the CKD patient reported, the fewer activities undertaken, and the greater fatigue. There were no significant age differences over time for fatigue or physical activity. Age differences were only found for SF-36 mental health at 3 months (t=-2.41, df=14, p<.05). Those younger than 65 years had lower emotional well-being compared to those aged over 65. Males had poorer physical health compared to females at 12 months. There were no significant gender differences on mental health at any time point. In the management of chronic kidney disease, early detection is necessary of a person's inability to engage in routine activities due to fatigue. Early detection would enable timely behavioural and problem-solving interdisciplinary care interventions to optimise HRQoL and independent exercise.

Introduction

Chronic kidney disease (CKD) is a complex condition which impacts on an individual's health-related quality of life (HRQoL) and ability to perform everyday activities. Fatigue is also a common symptom experienced by people with CKD. Little however is known about the influence of anaemia and whether fatigue contributes to HRQoL and activity levels over time.

•45% of people with CKD in stages 4 and 5 develop anaemia (Gandra et al. 2010)

•Anaemia is associated with decreased energy, tiredness, shortness of breath, weakness

•ESA (erythropoietin stimulating agent) is prescribed to increase haemoglobin levels and reduce these symptoms

•Fatigue is experienced by 70-97% of people with CKD (Murtagh et al., 2007)

•CKD patients prescribed an ESA for anaemia report higher fatigue levels (Bonner et al., 2008)

•People with CKD have a reduced capacity to engage in activities of daily living including exercise (Bonner et al., 2009)

Survival is longer in people with a better HRQoL & better health status, and less morbidity is associated with higher HRQoL (Untas et a., 2011)

Aim

This study sought to examine HRQoL, activity and fatigue levels of people with anaemia secondary to CKD over a 12 month period following the introduction of erythropoietin stimulating agent (ESA).

Method

Participants

28 people with CKD

Aged 31-84 years (Mean=64)

Materials

HRQoL measured by SF-36 (Ware, 2011)

Daily physical activity measured by Human Activity Profile (HAP)

Fatigue measured by Fatigue Severity Scale (FSS)

Data was collected at baseline (prior to commencing ESA, 3 months, 6 months and 12 months

Results

Table 1: SF-36 means, sd and repeated measures ANOVA scores

SF-36 Scales	Baseline	CKD Sample 3 months	6 months	12 months	Normative sample	*F*	*p*
Physical Health							
Physical functioning (PF)	42.7 (28.1)	47.39 (31.1)	54.75 (27.6)	25.45 (13.7)	84.2 (23.3)	3.96	ns
Role physical (RP)	41.17 (40.4)	10.85 (4.4)	80.76 (32.5)	63.63 (34.2)	80.9 (34.0)	12.29	P<.05
Bodily pain (BP)	70.1 (33.2)	74.43 (26.8)	50.75 (24.1)	48 (20.8)	75.2 (23.7)	.084	ns
General health (GH)	41.66 (18.6)	44.3 (21.45)	15.19 (4.5)	14.12 (4.45)	71.9 (20.3)	.64	ns
Physical health summary	56.6 (20.5)	44.58 (15.8)	72.13 (21.8)	56.38 (14.1)	50 (10.0)	-	-
Mental Health							
Vitality (VT)	38.04 (20.6)	46.42 (24.5)	52.61 (24.0)	50.0 (22.1)	60.9 (20.9)	3.93	P<.05
Social functioning (SF)	61.05 (32.4)	69.04 (28.9)	78.12 (31.4)	75.73 (26.3)	83.3 (22.7)	1.96	ns
Role emotional (RE)	63.88 (44.9)	85.0 (29.6)	94.11 (13.1)	86.66 (27.6)	81.3 (33.0)	.718	ns
Mental health (MH)	71.52 (15.2)	74.95 (15.6)	78.85(21.1)	82.13(12.9)	74.7 (18.1)	3.62	P<.05
Mental health summary	60.18 (21.8)	71.57 (17.8)	80.46 (13.9)	73.48 (15.7)	50 (10.0)	-	-

Table 2: HAP, Dyspnoea and fatigue mean and sd scores for repeated measures ANOVA

	Baseline M (*sd*)	3 months M (*sd*)	6 months M (*sd*)	12 months M (*sd*)	Normative sample	*F*	*p*
HAP scores							
Total activity	43.4 (17.7)	47.95 (20.1)	47.61 (23.6)	48.22 (23.23)	83.0	2.14	ns
Self-care	7.31 (1.12)	7.04 (1.77)	7.52 (0.98)	7.6 (0.77)	7.8	1.30	ns
Personal/ Household work	14.19 (6.7)	15.48 (7.2)	17.19 (6.03)	17.27 (4.52)	24.1	2.99	ns, p=.07
Entertainment/ Social	7.88 (2.87)	8.04 (2.53)	8.85 (2.61)	9.05 (2.53)	13.6	2.47	ns
Independent exercise	6.35 (5.26)	7.3 (5.04)	7.9 (6.17)	8.10 (6.34)	22.2	1.02	ns
Dyspnoea scores							
Dyspnoea	14.28 (7.61)	13.12 (8.34)	11.59 (7.74)	11.10 (7.90)	-	2.14	ns
FSS scores							
Fatigue	47.69 (13.18)	47.61 (12.8)	38.7 (17.18)	42.35 (13.19)	-	3.78	P<.05

Discussion

A consequence of impaired renal function is development of severe anaemia which affects normal physiological function, causes increased tiredness and reduces the ability to undertake daily activities including exercise.

We found that people with CKD prior to commencing an ESA have lower HRQoL when compared to healthy people, particularly apparent in SF-36 physical components (See Table 1). Levels of physical functioning and general health, as well as being able to undertake fewer physical roles contributed to lower HRQoL. Our sample had lower levels of vitality and experienced more difficulty with social functioning than healthy people, a finding consistent with Perlman et al. (2005).

When ESA treatment was commenced, there are some improvements in HRQoL, breathlessness (dyspnoea) and levels of fatigue over 12 months though their ability to undertake more activities does not change (Table 2). Improvements were seen for mental health components of the SF-36 (vitality and emotional well-being), a finding consistent with the literature (Gandra et al., 2010; Hamilton & Hawley, 2006). Our findings are also consistent with Johansen et al. (2011) that level of fatigue in dialysis patients is reduced as haemoglobin levels are corrected.

Although ESA has improved the potential for higher activity levels, there has not been a corresponding increase in activity levels as shown at 3, 6 and 12 months.

Conclusion

•There is a need for increased assessment by health-care teams to identify and monitor changes in HRQoL, fatigue and activity levels in people with CKD

•Early detection of a person's inability to engage in normal daily activities due to increasing levels of fatigue is necessary to allow timely interdisciplinary interventions which use behavioural and problem-solving techniques to optimize HRQoL and independent activity.

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