



Case Control Study – Retrospective 6 Years Follow Up – Adherence to Physiotherapy in Movement Disorder

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Abstract

Introduction: *study of movement disorders and their impact mainly among elderly population needs more emphasis as longevity is increasing every year globally WHO projected 60% of the population above 60 years, to be geriatrics was the alarm for neurological, musculoskeletal disorders among geriatric subject.*

Materials & Methodology: *This original research study with a 6 year follow up was conducted in Chennai from April 2012 till August 2018. An octogenarian with dyskinesia gait disturbances, decreased reaction time was treated with physio ball based exercises and home programme. Dyskinesia scale were measured and analyzed*

Results: *an improved dyskinesia scale by $P < .05$*

Conclusion: *with regular adherence to physiotherapy home exercises medication by neurophysician, support from family members, an improved functional activities with reasonable independence and dignified quality of life were the major findings which can be applied on similar subjects.*

Keywords: *PD, Dyskinesia, Brady Kinesia, DBS, WHO.*

Introduction

Parkinson's disease (PD) is characterized by bradykinesia, tremor, rigidity and impaired postural reflexes. In addition to the motor symptoms, mental disorders like depression, autonomic and gastro intestinal dysfunction may occur, all of these disorders considerably impair the quality of life of patients with PD (Schrag et al 2000) PD is the second most common neurodegenerative disorder, affecting 1% of adults over 60 years of age (Shima et al 1997)

Dopaminergic medications and DBS surgery provided improvements in balance and gait tasks by influencing neural pathways (MCN Neely et al 2013) and non pharmacological therapies were proven to be effective in managing gait stability among in a systematic review PD (Mehrholtz et al 2015), weekly twice rehabilitation programme using progressive resistance training for 10 weeks were effective in improving balance and gait function with stride length and velocity in subjects with PD (Hass et al 2012)

Bradykinesia refers to the slowness of the patients movements and affects every single patients (Beradelli et al 2001)

Physical exercises guidelines in PD have emphasized on cueing strategies, cognitive movement strategies, balance training aerobic, strength and flexibility training (Keus et al 2007)

Background Information

This study subject, a widow and mother of 3 children, graduate, non diabetic, non hypertensive and a home maker c/o slowness of activities, stiffness of neck left arm and leg difficulty in walking and occasional giddiness.

Ectomorph, ambulant unaided with small steps with decreased heel contact and ground clearance

O/E

- Left upper and lower extremities hyper tonicity and hyper reflexia were recorded
- Mobility and transfer she was independent
- Cognitive domain was good with good reaction time for physical activity and verbal response
- Range of motion of peripheral joints except for end range restrictions were full
- Head ache with neck stiffness were recorded, cervical spine movement restriction and tightness of soft tissue structures.

Materials and Methodology

From April 2012 till August 2018 this study subject with dyskinesia was treated with Physioball based exercises in supine, side, sitting and standing, following consent obtained from her and the care giver. The nature of exercises were resisted exercises, closed kinematic chain exercises, core strengthening. With a weekly frequency of two times, each session lasting for 25-30 minutes. Dyskinesia Scales were recorded, analyzed and tabulated in the results table as below. A set of home programme where the subjects adherence was good along with physiotherapist guided exercises.

Dyskinesia rating scale, where hyper kinematic movements of arms, legs, neck, face and trunk on

a scale from 0-4 on a progressive scale and among PD (Hagell et al 2000)

Table of results

Test	Dyskinesia Scale	SD	SE	t	P
pre	36	10.39	6	3	<.05
post	18				

Discussion

This original research strives to analyse with evidence the hypothetical questions arising from clinical (MCID) and statistical findings as below

1. Can vertigo, balance and bradykinesia be improved with exercises among P.D?

Vertigo which cover a variety of symptoms regarding disorders of spatial orientation and motion perception can affect the ability to achieve a stable gaze, posture and gait (Jacob et al 1989) a common and serious issue in the elderly, while its prevalence rising to 50% beyond 85 years (Crimmins et al 2004) dizziness is one of the strongest contributors to, we disability burden after age 65 (Mueller et al 2014) hence customized rehabilitation programmes are highly recommended (Deveze et al 2014) and adherence with home exercises are more effective (Holden et al 2014). Physical therapists in conjunction with the care givers and neurologists should adapt, modify and tailor the exercise program to the patents specific needs (Eli Carmeli et al 2017). Exercises used in this research was customized for vertigo, balance and bradykinesia as evidenced by the above research reports.

2. Do resisted exercises have a role in P.D?

Resistance training program for 24 weeks was favourable in improving balance, coordination and agility in elderly (Macaluso et al 2004). Physical activities reduces the deterioration of physical fitness variables such as CV endurance, strength and flexibility, balance, helping to accelerate the functional losses in the elderly (Zoran et al 2013). In line with above studies this research subject who was regular in combined home exercise and supervised exercises has recorded a good quality of life as evidenced statistically and clinically.

Sacropemia is considered a secondary cause of bradykinesia (Berardelli et al 2001) and muscle weakness is also strongly related to impaired balance, since it reduces the ability to respond to postural and balance modifications (Toole et al 1996). Resistance training were considered as an efficient intervention aiming at reducing muscle weakness, bradykinesia, balance problems, improving bone parameters, physical functioning, ADL and the QOL (David et al 2012). This study subject was treated with more resisted exercises hence positive benefits of the outcome of the study were supported by the above research evidences.

3. Does physiotherapy can facilitate QOL among P.D subjects?

Alessandro et al 2015 have shown with high intensity protocol, an improved score in UPDR scale, better QOL and functional capacity. Levodopa induced dyskinesia is a major problem associated with the chronic use of Levodopa for symptomatic treatment of Parkinson's disease (Frankel et al 1989) with varying impact on functional ability quality of life (Pechevis et al 2005) and well known causes of falls (Rudzinska et al 2013)

4. What mechanism of how exercises has an impact among P.D subjects?

To maintain balance, the brain uses all available sensorial cues from vestibular, visual and Proprioceptive inputs, which in turn are integrated by the CNS to execute adequate motor responses, but varies from patient to patient (Shumway et al 1996). Voluntary exercises may increase brain derived neurotrophic factor levels thus enhancing neuronal function by promoting synaptogenesis and neurogenesis (Krisztina et al 2014)

Clinical Course of this Subject

With adherence to regular physiotherapy and home exercises, she was able to walk brisker, safe with confidence and an improved reaction time. Stiffness in the body has come down constitutional symptoms such as constipation, energy levels, digestion have improved as reported by her and care givers, the neuro

physician was in particulars appreciating her continued clinical progress.

Conclusion

With lack of social support system for geriatric population and an increasing prevalence of Parkinson's disease in India, more focus to be laid on these subjects with physiotherapy means larger sample size, including control groups, analyzing with other means of exercises and qualitative variables for gait, activities of daily functions are highly recommended

Limitations of the study

With lack social support system for geriatric population and an of case study and few variables were studied were the major limitations, hence larger sample size of both sex, with more variables are recommended. The author declares no conflict with publication of this original research report.

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