

Simple Assist Device for Parkinson's Patients

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Abstract- This paper focuses on the difficulties faced by a person suffering from Parkinson's and how they can overcome these difficulties by using a simple device. This device focuses on helping patients suffering from muscle tremors. It aims at making daily activities easier and more manageable.

Keywords - Parkinson's disease, Muscle tremors, Rehabilitation, Assistive device, Dopamine, Degenerative disorder.

I. INTRODUCTION

7-10 million people worldwide suffer for this degenerative disorder that affects the central nervous system. Parkinson's is a result of the death of dopamine-generating cells in the substantia nigra region of the mid brain. This neural disorder consists of 5 stages. It is mostly seen in people aged 50 yrs and above. Men are 1½ times more likely to suffer from Parkinson's than women.

II. EXSISTING DEVICES

Several devices in the market cater to the needs of Parkinson's patients. Some simple devices used to assist in eating and drinking is cutlery with built up handles. Foam handles aid grasp. Mugs with two handles make gripping easier. Insulated bowls, plates and mugs keep food warm incase the patient takes time to eat or drink. Plates with raised edges help prevent food from slipping over the sides. Placing soap in a bath mitt or bag on a rope prevents it from falling to the floor. For additional support, grab rails and shower stools should be included. Toothpaste dispensers that do not require the patient to squeeze the tube are another simple aid. Clothes that fasten at the front or have Velcro are easy to manage. Similarly, shoes with Velcro straps are preferred. A daily medical organizer with countdown timers helps patients keep track of their medication. Other aids include hand braces, wrist bands for smartphones etc.

III. MATERIALS

This simple Parkinson's aid was made using commonly used materials in our daily lives. A pair of simple cloth gloves formed the backbone of the device. The left glove consisted of a simple knob which was used to control the elastic strings. The right glove has a simpler mechanism. It consisted of five magnets at the five fingertips.

IV. THE DEVICE

It is a simple and basic device that caters to people in stage II and above of Parkinson's. It aims at providing those suffering from tremors assistance to perform simple everyday activities. It allows them to perform mundane tasks that involve having a stable grip.



Fig1: The rehabilitation device

It consists primarily of two gloves- the right and left glove.

The left glove (fig2) has elastic strings attached along the fingers to a metal knob. Rotating this knob pulls the fingers and helps hold/grip objects. This knob is held in place with a magnet.



Fig2: The left glove- rotating the knob using the right glove to grip utensils

The right glove (fig3) has a simpler yet efficient design. It consists of 5 magnets, one on each fingertip. This enables the patient to hold/lift metallic objects such as keys with ease. The addition of a small metal band around frequently used objects such as walking sticks, medicine bottles etc aids them in performing tasks with ease.



Fig3: The right glove- magnets help hold magnetic objects such as keys.

The gloves work perfectly together as the magnetic glove makes turning the knob on the left glove easier and effortless.

V. ANALYSIS

The left glove is efficient in gripping objects with a larger radius. Rotating the knob at the centre is easy due to the magnets on the right glove. It was found that larger objects were successfully held using the left glove.

The right glove was successful in assisting the user to hold up light weight magnetic objects such as keys and utensils.

VI. CONCLUSION

This device, however simple would make a significant difference in the Parkinson's patient's life. It would assist them in performing mundane tasks with ease.

REFERENCES

- [1] Eimear O'Brien, Brand Communications, UCB Magazine, 11 April, 2013
- [2] The National Collaborating Centre for Chronic Conditions, ed. (2006). "Other key interventions", *Parkinson's Disease*. London: Royal College of Physicians. pp. 135-46
- [3] How to help someone cope with Parkinson's disease, www.ehow.com