

## Assessing the feasibility of "low-tech" exercise and the impact on physical functioning in haemodialysis patients: a pilot study

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Haemodialysis (HD) patients have reduced physical functioning and activity levels and this compromise their quality of life and survival<sup>1</sup>. It is recommended that dialysis patients increase their level of physical activities<sup>2</sup>. Exercise interventions have shown potential in improving physical performance<sup>3</sup> and quality of life<sup>4</sup>. Intradialytic exercises have also shown to improve dialysis clearance<sup>5</sup>, vascular health<sup>6</sup>, heart rate variability<sup>7</sup>, inflammation<sup>8</sup> and body composition<sup>9</sup>. The majority of these previous studies have used cycle ergometers which are expensive and not always accessible. We conducted a pilot study to test whether an exercise protocol combining resistance training and a simple and flexible aerobic exercise (walking) will be practical and would bring beneficial outcome on physical function and other outcome measure such as body composition, dialysis clearance, inflammation and anaemia among HD patient.

The study included adults aged 18yrs or older, on haemodialysis for at least 3 months at St. George's hospital or satellite unit(s), have commenced/about to start anaemia management therapy, ability to communicate sufficiently in English and provide informed written consent. It excluded Individuals contraindicated to undertake exercise and those who changed mode of dialysis or received transplantation during intervention period. The consent participants were randomly allocated to either intervention or control groups. The intervention program involved walking for atleast 30 minutes, five times per week plus strength training whilst in dialysis for eight weeks. Outcome measured were: Physical Function (assessed with the 30s Sit-to-Stand test), grip strength dynamometer, quality of life (assessed with SF-36v2 questionnaires), Biochemistries (clinic routine blood tests on C-RP, albumin, creatinine, urea), nutritional status (SGA, waist circumference) and body composition (I.E lean tissue and fat tissue mass using Fresenius BMC machine), dietary intake (3 days food diaries). The feasibility of the study was assessed using questionnaires.

Participants' nutritional status was satisfactory but their energy and protein intakes were sub-optimal (table 1). Muscle functioning (measured by hand grip strength and sit to stand test) was poor and quality of life (measured by SF-36v2 questionnaire) was lower than that of the general population and a comparable cohort of dialysis patients. The exercise intervention could not bring desirable changes in body composition, inflammation or haemoglobin status of participants. However, the increase in weight lifted in each session from 3/4th week to the final 7th/8th week showed up to 98% improvements (i.e double the amount lifted in the early stage of the intervention) figure 2. The exercise intervention was acceptable by patients and clinic personnel (figure 1) but proven to be challenge to implement because, despite utilizing inexpensive equipment, in order for the programme to succeed, it requires investment from a full time physiotherapist or physiotherapy assistant to motivate and supervise patients.

We recommend that all dialysis units consider including exercise professionals within the standard care services to promote role of exercise in improving physical and mental health. We propose for this protocol (low-tech and flexible exercise) to be tested in a larger group and for extended period of time, whilst addressing shortcoming of this pilot study.