Effect of Intradialytic Aerobic Exercise among Hemodialysis Patients in the United Arab Emirates on Clinical Outcomes, Barriers to Physical Activity, and Quality of Life

VALORIZATION

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Chronic kidney disease (CKD) is a global health concern (Eckardt et al., 2013) with a prevalence of 13.4% worldwide (Hill et al., 2016). In 2017, it was estimated that 3.2 million patients globally were undergoing dialysis; this number was at 3 million in 2016, thus presenting a 6% annual growth rate (Fresenius Medical Care, 2017). In addition, CKD patients have increased mortality rate compared to the healthy population (Johansen et al., 2000). In 2015, the United Arab Emirates (UAE) had 1750 hemodialysis (HD) patients with an annual mortality rate of 8.5% (AlSahow et al., 2016). Furthermore, in 2018, home hemodialysis became an option for elderly, bed ridden Emirati patients (The national, 2018). All of this projects an increase in the economic burden of end stage renal disease.

Aside from the economical burden, dialysis patients present a social burden when it comes to their decreased quality of life (QOL) and their sedentary lifestyle. HD patients have decreased QOL as compared to healthy adults (Avramovic & Stefanovic, 2012). Furthermore, QOL tends to deteriorate with the advancement in CKD stages (Aggarwal et al., 2016). The situation in the UAE is not different and chronically ill patients have lower QOL scores when compared to healthy individuals (Ayoub & Hijjazy, 2013). Looking at HD patient's activity level, it was reported to be less than that of healthy sedentary controls (Johansen et al., 2000). As QOL and sedentarism could predict mortality rate (O'hare et al., 2003; Stack et al., 2005; Tentori et al., 2010; Avramovic & Stefanovic, 2012), there is an urge to find an adjunctive therapy to ease the social and economical pressure of HD patients. This thesis focused on IDE as a complementary therapy for HD patients that could impact on this social and economical burden.

Today, public health awareness campaigns are highlighting the importance of exercise in a healthy lifestyle, whether you are a healthy individual or a chronically ill patient. The global attention of stakeholders and health care professionals is focused on how to improve patients' health outcomes, increase the quality of life and decrease the health care costs.

Our project supported this global perspective by being a pioneer in exploring the effect of IDE on various clinical and social outcomes in HD patients in the UAE. After the completion of our study, we could say that intradialytic aerobic exercise (IDE) could be a safe option to enhance treatment from a different angle; this could be

possible with a minimal primary investment that covers the equipment's cost and the salary of a coordinator to assist the patients with IDE in collaboration with the nursing staff. Moreover, the initiation of IDE will require a primary assessment of the patient by his nephrologist, and the education for the staff about the benefits, and proper protocol of IDE.

Introducing IDE in HD population is a challenge, especially that many patients think of it as adding a burden to their situation. Thus, rises the need of more research focusing on the cost effectiveness of IDE, and on how it could alleviate the health and economic burden on the patient, the society, and the health care system. Cost effectiveness could be evaluated based on the hospitalization rate, the intake of phosphate binders, and maybe the frequency and duration of the weekly dialysis sessions. With the advancement of new technologies such as fitness trackers, step counter watches, and renal food applications, the motivation, assessment and accurate follow-up are now easier. In addition to the readily available, user friendly, low cost bio-impedance analyzers that offers an accurate body composition analysis. It is worth mentioning that a renal food application culturally specific for the UAE "KELA.ae" (developed by Dr. Mirey Karavetian and funded by Zayed University) has been launched in 2017. This application would not only benefit UAE dialysis patients, but also researchers in that field. It could minimize the cost of research that requires patient education on the renal diet. Such applications would also complement an IDE program, as nutrition and exercise goes together.

Besides, this dissertation highlighted the high prevalence of malnutrition among HD patients in the UAE. Therefore, future research should focus on IDE and malnutrition to position IDE as a preventive measure for the commonly reported deterioration of the nutritional status of HD patients over time (Karavetian et al., 2016).

In the UAE, 40% of the hemodialysis patients are Emirati citizens (AlSahow et al., 2016), which means that the government covers their health insurances. Hence, an initiative from the government side to support IDE programs might lessen the cost burden on the healthcare system. Also, we hope to see in the future more organizational efforts, whether from hospitals or private dialysis centers, on this matter. Organizations could take the initiative and implement IDE. For instance, a pediatric dialysis unit in Argentina is offering an amazing physical activity program for their patients. A small video about their work could be seen on https://www.youtube.com/watch?v=4mPcKXL5B70&t=89s. "Plagiarism" in this sense would not be a crime!