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Commentary

Exercise as a promising intervention in head & neck cancer patients

In India, head and neck cancer (HNC) accounts for approximately 30 per cent of all cancers and is an important disease in terms of incidence and mortality in the region[1]. The primary risk factors associated with head and neck cancer include tobacco use, alcohol consumption, and infections such as human papillomavirus infection and Epstein-Barr virus[2]. Oral cancers, in particular, are more common in India, owing to the high prevalence of tobacco use and unique practices of betel quid and areca nut chewing[3].

The prognosis for HNC is dependent on the stage at diagnosis and the site of the tumour[4,5]. The five-year survival rates for early stage (I and II) range from 60 to 95 per cent[4] and late stage (III and IV) range from 0 to 50 per cent[5]. Surgery remains a primary modality of therapy for early stage resectable tumours. For more advanced stage cancers, surgery is most often followed by radiotherapy. HNC is now more commonly treated with organ preserving neoadjuvant or concomitant chemoradiotherapy (CRT)[2]. The use of concomitant CRT has avoided many cosmetic and functional losses associated with surgery but commonly results in long-term effects such as loss of muscle mass, profound deconditioning and fatigue[6].

Exercise has emerged as a promising intervention in cancer prevention and control[7]. Several studies have examined physical activity and exercise behaviour in the cancer population. The percentage of cancer survivors who exercise regularly is shown to be as low as 20 per cent[8]. In a cohort study of HNC survivors, only 30.5 and 8.5 per cent were meeting public health guidelines for physical activity pre-treatment and after diagnosis, respectively[9]. These findings suggest that the impact of HNC treatment on activity level is significant and that the majority of HNC patients are not likely exercising at a sufficient level to provide health benefits[9]. Observational data from the prostate, lung, colorectal, and ovarian (PLCO) cancer screening trial demonstrated a protective association between increased physical activity and HNC risk[10]. While the relationship between physical activity and HNC survival is not clear, the finding suggests a need for, and potential benefit from interventions to promote physical activity and exercise during and following HNC treatment.

Research has demonstrated the safety, efficacy, and feasibility of physical activity and exercise interventions during and following cancer treatment[11]. There is now strong evidence in support of the benefits of exercise on body composition, cardiorespiratory fitness, muscular fitness, flexibility and quality of life for cancer survivors both during and following treatment. Speck *et al*[11] performed a combined systematic review and meta-analysis examining the benefit of exercise interventions for health-related outcomes including quality of life. The review focused on two time points along the cancer continuum; during and following cancer treatment and included data from 82 controlled trials. In the meta-analysis, the pooled results showed a small to moderate positive effect from exercise interventions carried out during cancer treatment for outcomes such as functional capacity, muscular strength, functional quality of life, anxiety and self-esteem. While this review provides strong evidence in support of exercise as an intervention for cancer patients and survivors, the evidence to date is largely from trials performed with breast cancer survivors (*i.e.* 83%). In the case of HNC, only a few exercise trials have been performed, and the need for empirical research on the relative safety and efficacy of exercise in this population is long overdue.

Samuel and colleagues in this issue have performed a randomized controlled trial (RCT) including 48 HNC patients undergoing concomitant CRT[12]. The 24 HNC patients randomized to the intervention group followed

a six-week supervised walking and active exercise training programme, while the 24 control patients only received advice to remain as physically active as possible over the course of treatment. The preliminary findings support the safety and efficacy of supervised exercise to improve functional capacity and quality of life (mental component score) among HNC patients undergoing CRT. The authors have demonstrated the use of standardized outcome measures in the study to document change over time. The use of the six-minute walk test, a low complexity test, is a strength of the study. Although maximal oxygen uptake (VO_{2max}) is considered the gold standard measure of functional capacity, maximal testing is often not practical in the clinical settings. The six-minute walk test is a clinically feasible objective measure of functional capacity that avoids the need for expensive equipment and specialized training. As the authors acknowledge, a minimal clinically important difference (MCID) for the six-minute walk test in the range of 50 metres has been established in other disease populations. While the median improvement of 42 metres in the intervention group did not meet this MCID; the findings should be considered in light of the median decline of 96 metres seen in the control group[12]. As other studies have found, the benefit of exercise may be in the prevention and/or attenuation of declines in functional capacity commonly observed during anti-cancer treatment[12]. Importantly, both the supervised exercise protocol and standardized outcomes used in the study are feasible for implementation in the clinical setting.

The strengths of this study include being the first RCT to examine the effect of exercise on functional capacity in patients with HNC undergoing CRT. As HNC and its treatment result in considerable impairment, patients often have very specific needs beyond those of most other individuals diagnosed with cancer.

The authors have also addressed the limitations of their research study, namely factors associated with risk of bias such as lack of allocation concealment and blinding of outcome assessors[12]. Furthermore, this study would have been strengthened by the inclusion of other relevant outcomes. For example, as the intervention consisted of both walking and active exercise training, the collection of data on measures of musculoskeletal fitness, body composition and symptoms of fatigue would have allowed for a more comprehensive understanding of the effect of the exercise intervention on overall physical functioning. The lack of data on exercise adherence and factors affecting adherence are additional limitations of the study. As fatigue is a common and debilitating symptom during HNC treatment, onset of this symptom may have affected attendance at supervised sessions and impacted exercise performance. Alternatively, improvements in functional capacity may have mediated the fatigue response potentially allowing for better exercise adherence and performance[13]. Collection of this important data would be valuable to further understand the inter-relationship between exercise and fatigue[12].

In 2010, a round table was convened by the American College of Sports Medicine to review the evidence and provide guidelines for cancer survivors on physical activity[7]. The panel concluded that cancer patients and survivors, even those undergoing intensive anti-cancer treatment protocols, should be advised to remain active. As nicely illustrated in this RCT[12], despite undergoing CRT, these HNC patients were able to successfully participate in, and obtain benefit from a six-week supervised exercise intervention during treatment. As noted by Samuel *et al*, based on the positive findings of their study, future research directions include determining the optimal type and intensity of exercise for HNC patients.

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References

1. Mehrotra R, Singh M, Gupta RK, Singh M, Kapoor AK. Trends of prevalence and pathological spectrum of head and neck cancers in North India. *Indian J Cancer* 2005; *42* : 89-93.
2. Stenson KM, Maccracken E, Kunnavakkam RW, Cohen EE, Portugal LD, Villaflor V, *et al*. Chemoradiation for patients with large-volume laryngeal cancers. *Head Neck* 2012; *34* : 1162-7.
3. Hashibe M, Brennan P, Chuang SC, Boccia S, Castellsaque X, Chen C, *et al*. Interaction between tobacco and alcohol use and the risk of head and neck cancer: pooled analysis in the International Head and Neck Cancer Epidemiology Consortium. *Cancer Epidemiol Biomarkers Prev* 2009; *18* : 541-50.
4. Masters G, Brockstein B. Overview of head and neck cancer. In: Brockstein B, Masters G, editors. *Head and neck cancer*. New York: Kluwar Academic Publishers; 2003.

5. Semple CJ, Sullivan K, Dunwoody L, Kernohan WG. Psychosocial interventions for patients with head and neck cancer: past, present and future. *Cancer Nurs* 2004; *27* : 434-41.

6. Taylor JC, Terrell JE, Ronis DL, Fowler KE, Bishop C, Lambert MT, *et al*; University of Michigan Head and Neck Cancer Team. Disability in patients with head and neck cancer. *Arch Otolaryngol Head Neck Surg* 2004; *130* : 764-9.

7. Schmitz KH, Courneya KS, Matthews C, Demark-Wahnefried W, Galvao DA, Pinto BM, *et al*. American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. *Med Sci Sports Exerc* 2010; *42* : 1409-26.

8. Vallance JK, Courneya KS, Jones LW, Reiman T. Differences in quality of life between non-Hodgkin's lymphoma survivors meeting and not meeting public health exercise guidelines. *Psychooncology* 2005; *14* : 979-91.

9. Rogers LQ, Courneya KS, Robbins KT, Malone J, Seize A, Koch L, *et al*. Physical activity and quality of life in head and neck cancer survivors. *Support Care Cancer* 2006; *14* : 1012-9.

10. Hashibe M, Hunt J, Wei M, Buys S, Gren L, Lee YC. Tobacco, alcohol, body mass index, physical activity, and the risk of head and neck cancer in the prostate, lung, colorectal, and ovarian (PLCO) cohort. *Head Neck* 2012; Jun 19 (online DOI 10.1002/hed.23052).

11. Speck RM, Courneya KS, Masse LC, Duval S, Schmitz KH. An update of controlled physical activity trials in cancer survivors: a systematic review and meta-analysis. *J Cancer Surviv* 2010; *4* : 87-100.

12. Samuel SR, Maiya GA, Babu AS, Vidyasagar MS. Effect of exercise training on functional capacity & quality of life in head & neck cancer patients receiving chemoradiotherpy. *Indian J Med Res* 2013; *137* : 515-20.

13. Courneya KS, Sellar CM, Stevinson C, McNeely ML, Peddle CJ, Friedenreich CM, *et al*. Randomized controlled trial of the effects of aerobic exercise on physical functioning and quality of life in lymphoma patients. *J Clin Oncol* 2009; *27* : 4605-12.