Exercise in the Management of Chronic Diseases: An Underfilled Prescription

Kassem Sharif MD and Howard Amital MD MHA

Department of Medicine 'B' and Zabludowicz Center for Autoimmune Diseases, Sheba Medical Center, Tel-Hashomer, affiliated with Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

KEY WORDS: physical activity, primary prevention, secondary prevention, risk factors, cardiovascular diseases

IMAJ 2018; 20: 51–52

"If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health"

Hippocrates, 300 BCE

Chronic diseases are now becoming the plague of the new century, responsible for seven out of the top ten causes of mortality in the United States. Chronic conditions are burdensome due to the potentially devastating health sequelae, increased medical expenditures, and high annual health care costs [1]. Due to the complexity of these conditions a more comprehensive, integrative, and holistic approach is advised for disease management. Such an approach involves pharmacotherapy as well as a focus on lifestyle modifications.

Physical activity is now regarded as a principal and integral intervention in the primary and secondary prevention of chronic diseases. Using physical exercise as part of a medical regimen is not a new concept, but the acceptance of this integration and concept, surprisingly, did not occur until the last decade [1].

The impact of exercise spans from prevention to treatment. Epidemiological studies and interventional longitudinal research support its role in the primary prevention of chronic diseases [2]. Similarly, engaging in exercise after disease diagnosis has been shown to change or halt disease progression, improve quality or life, and extend lives [3].

Several monumental studies have increased the awareness regarding the integral role of physical activity in improving health outcomes. Nevertheless, levels of physical activity have remained relatively unaltered in the last decade or so. Patients with chronic diseases are caught in a vicious cycle of physical deconditioning, where their disease decreases their ability to engage in physical activity [4]. This weakening results in a downward cycle with a subsequent decrease of functional status and a decreased ability to be involved in exercise. Therefore, in secondary prevention, the aim is to reverse the deconditioning status, leading to optimized physical functioning and improved overall functional capacity and well-being with a parallel decrease in the impact of traditional cardiovascular risk factors such as diabetes and hypertension [3].

In the current issue of *IMAJ*, Tayer-Shifman and colleagues [5] eloquently described the positive influence of physical exercise on improving prognostic parameters in patients with chronic diseases. In their retrospective study, they examined medical records of close to 900 individuals. The individuals had chronic diseases with diverse etiologies including metabolic, organ specific, and pain syndromes, which prevented them from signing a bona fide health declaration. Therefore, they were excluded from standard fitness facilities. In a specialized medical fitness facility, each individual enrolled in the study received specialized exercise and diet plans with physical assessments done at enrollment and after 4 months of exercise. Among the studied sample, the authors documented a significant decrease in body mass index (BMI), increased exercise capacity, and improved quality of life measures as assessed by Short Form Survey (SF-36). Taken together, the results corroborate the favorable impact of physical activity on various measures in this population of common needs (i.e., chronic diseases). Moreover, the authors of this study underscored an essential point, which is that there are decreased rates of adherence to exercise. The adherent individuals included more male patients, married individuals with advanced age, and patients with pulmonary and cardiovascular diseases.

Our challenge at the present time is to devise a clinical paradigm where treating physicians and sports medicine specialists work together, in parallel, to provide scientifically proven medical exercise interventions that are tailored to the specific needs and capabilities of our patients. Furthermore, due to the crucial role exercise plays in prevention and treatment, physicians must be aware of the importance of exercise so that prescribing exercise therapy occurs more often. It is imperative that physicians should motivate patients to exercise and perhaps set an individual example in this aspect encouraging adherence with such respective exercise regimens.

Correspondence
Dr. H. Amital
Head, Dept. of Medicine 'B', Sheba Medical Center, Tel Hashomer 52621, Israel
Phone: (972-3) 530-2652
Fax: (972-3) 535-4796
email: howard.amital@sheba.health.gov.il

References

1. Ward BW, Schiller JS, Goodman RA. Multiple chronic conditions among US adults: a 2012 update. *Prev Chronic Dis* 2014; 11: E62.
2. Bauman AE. Updating the evidence that physical activity is good for health: an epidemiological review 2000–2003. *J Sci Med Sport* 2004; 7 (Supplement 1): 6-19.
3. Durstine JL, Gordon B, Wang Z, Luo X. Chronic disease and the link to physical activity. *J Sport Health Sci* 2013; 2 (1): 3-11.
4. Pinto AJ, Roschel H, de Sa Pinto AL, et al. Physical inactivity and sedentary behavior: overlooked risk factors in autoimmune rheumatic diseases? *Autoimmun Rev* 2017; 16 (7): 667-74.
5. Tayer-Shifman OE, Bar-On Y, Pereg D, Hershko A. Physical training in a medical fitness room for patients with chronic diseases: functional and metabolic outcomes. *IMAJ* 2018 20 (1): 20-24.

Capsule

Detecting skeletal growth

During development, bone is created by a process called endochondral ossification, which results in the production of a fragment of type X collagen. Endochondral ossification also occurs during long bone growth and fracture healing. **Coghlan** and co-authors discovered that the type X collagen fragment could be isolated from blood and that its concentration correlated with skeletal growth velocity. Fragment concentration was inversely correlated with age and fluctuated during fracture healing in adults. The assay to quantify the fragment could be useful as a real-time marker of skeletal growth in children or for monitoring response to treatment for growth and bone disorders.

Sci Transl Med 2017; 9: eaan4669

Eitan Israeli

Capsule

Priming T follicular helper cells

In our immune systems, T follicular helper (Tfh) cells modulate antibody production by B cells. **Krishnaswamy** et al. examined the ability of conventional dendritic cell (cDC) subsets to prime Tfh commitment in response to intranasal immunization in mice. $CD11b^+$ migratory type 2 cDCs (cDC2s) played an essential role in promoting commitment of activated T cells to the Tfh lineage. The authors imaged trafficking of cDC2s after intranasal immunization and found that they carried antigens to the site within the lymph node where Tfh cell priming occurs. These findings have important implications for vaccine design and delivery.

Sci. Immunol 2017; 2: eaam9169

Eitan Israeli

Capsule

Identification of clusters of foot pain location in a community sample

Gill et al. analyzed data from the North West Adelaide Health Study. Data were obtained between 2004 and 2006 using computer-assisted telephone interviewing, clinical assessment, and self-completed questionnaire. The location of foot pain was assessed using a diagram during the clinical assessment. Hierarchical cluster analysis was undertaken to identify foot pain location clusters, which were then compared in relation to demographics, co-morbidities, and podiatry services utilization. There were 558 participants with foot pain (mean age 54.4 years, 57.5% female). Five clusters were identified: 1 with predominantly arch and ball pain (26.8%); 1 with rear-foot pain (20.9%); 1 with heel pain (13.3%); and 2 with predominantly forefoot, toe, and nail pain (28.3% and 10.7%). Each cluster was distinct in age, gender, and co-morbidity profile. Of the two clusters with predominantly forefoot, toe, and nail pain, one of them had a higher proportion of men and those classified as obese and/or they had diabetes mellitus and used podiatry services (30%), while the other was comprised of a higher proportion of women who were overweight and reported less use of podiatry services (17.5%).

Arthritis Care Res 2017; 69: 1903

Eitan Israeli

"A stupid man's report of what a clever man says can never be accurate, because he unconsciously translates what he hears into something he can understand"

Bertrand Arthur William Russell, 3rd Earl Russell, (1872–1970), British philosopher, logician, mathematician, historian, writer, social critic, political activist and Nobel laureate