www.ijpm.ir

Preventive Medicine Needs to Begin with Our Children

Danielle M. Lambrick, Lee Stoner[1], James Faulkner[1], Michael J. Hamlin[2]

Institute of Food Nutrition and Human Health, Massey University, New Zealand, [1]School of Sport and Exercise, Massey University, Wellington, New Zealand, [2]Department of Social Sciences, Parks, Recreation, Tourism and Sport, Lincoln University, New Zealand

Correspondence to:
Dr. Danielle M. Lambrick, Institute of Food, Nutrition and Human Health, Private Bag 756, Massey University, Wellington 6140, New Zealand.
E-mail: D.Lambrick@massey.ac.nz

Date of Submission: Dec 21, 2012

Date of Acceptance: Mar 27, 2013

How to cite this article: Lambrick DM, Stoner L, Faulkner J, Hamlin MJ. Preventive medicine needs to begin with our children. Int J Prev Med 2014;5:129-31.

Letter to Editor

DEAR EDITOR,

The prevalence of obesity and cardiovascular disease (CVD) has become so pervasive that for the first time, the current generation of children in the United States are not expected to live as long as their parents.[1] Although CVD is typically associated with middle-or old-age, the atherosclerotic process often initiates early in childhood and is occurring at an increasing rate.[2,3] There is a consensus that the current epidemic is founded upon changes to modifiable life-style factors.[4] Adverse changes in physical activity, nutrition, and sleep behavior have been strongly linked to the development of a host of cardio-metabolic conditions, including obesity, dyslipidemia, hypertension, and type 2 diabetes mellitus.[5] These conditions independently and additively increase CVD risk, even in children and adolescents.[6-10]

The increasing rate of sedentariness and decreasing rate of physical activity may lead to inadequate development of musculoskeletal, neuromuscular, endocrine, and cardiovascular systems.[11-13] The result is that today's children and adolescents are not only becoming pre-conditioned for CVD, but are also, due to developmental issues, unable to achieve the level of health achieved by their parents.[1] By only focusing on the clinical manifestations of CVD that is "reactive" medicine, we are tackling the problem too late. Public health-care policy needs to place a stronger focus on paediatric "preventive" medicine, not only for the well-being of children, but also to alleviate the increasing economic cost that is being placed on society through the prolonged burden of disease.[14,15]

A particular concern is the growing obesity epidemic.[14-16] Although genetic factors might influence the susceptibility of individuals to gain weight,[17] there is a consensus that changes in life-style activities have driven the current epidemic.[4] Dietary modification has been shown to be relatively ineffective in the long-term treatment of obesity in adults[18,19] and it has been suggested that obesity prevention in childhood and adolescence should focus on physical activity rather than diet because of fears relating to eating disorders.[20] The World Health Organisation (WHO) recommends that children aged 6-17 years participate in at least 60 min of moderate-to-vigorous intensity physical activity every day and perform muscle-strengthening and bone strengthening exercise on at least 3 days/week.[21] However as obese children and adolescents are disadvantaged by physical (i.e. excess body weight) and cardiovascular constraints, their capacity to comply with WHO recommendations is restricted.

A meta-analysis of exercise treatment programs in obese children and adolescents has shown that the most effective exercise paradigm for this population

incorporates high repetition resistance training combined with low-intensity, long-duration aerobic exercise.[22] Resistance training has been shown to be well-tolerated by this cohort and results in positive changes to body composition. Low-intensity, long-duration aerobic exercise has been shown to have positive results on body weight and body composition in obese children,[20] but is ultimately is limited in capacity when compared to high-intensity exercise for decreasing obesity, cardio-metabolic conditions, and the progression of CVD.[23-25] There remains a pressing need to develop and assess vigorous-intensity exercise programs, which are safe, tolerable, and enjoyable for obese children and adolescents.

It is commonly accepted that increased physical activity is required to curb the obesity epidemic,[20,26] but physical activity interventions with children are notoriously difficult to implement over a long-duration. A recent systematic review and meta-analysis[27] reported that physical activity interventions had at best a small effect on children's overall activity levels. This suggests that standardised exercise "interventions" are ineffective and that fun, enjoyable "life-style changes" are required to optimise the likelihood of long-term sustainability. Such discouraging data[27] necessitates the need for researchers to adopt holistic research paradigms. Researchers should be cognisant of inter-related life-style factors, including physical activity/inactivity, nutrition, and sleep behavior as well as human factors including motivation and well-being. Objective measures of daily physical activity, nutrition, sleep behavior, and human factors are required to provide insights into the efficacy of a physical activity life-style program.

Lastly, indigenous youth appear to be particularly susceptible to the ever pervasive prongs of obesity. For example, within New Zealand, much higher rates of obesity have been reported for Pasifika (22.3%) and Māori (11.8%) children than their European counterparts (5.5%), placing these cohorts at greater risk for cardio-metabolic disorders and subsequent CVD.[28] Life-styles programs for indigenous cohorts should not only be physiologically appropriate, but also culturally sensitive. Appropriately designed programs should present an accessible, relatively inexpensive, fun, and engaging option for promoting healthy life-styles that are culturally-aligned.[29,30]

Increasing rates of obesity and subsequent CVD are not only placing an increasing burden on the physiological and psychological well-being of today's children and adolescents, but also on the wider society. Public health-care policy needs to place a stronger focus on paediatric "preventive" medicine, and holistic physical activity programs are recommended.

REFERENCES

1. Olshansky SJ, Passaro DJ, Hershow RC, Layden J, Carnes BA, Brody J, *et al*. A potential decline in life expectancy in the United States in the 21st century. N Engl J Med 2005;352:1138-45.
2. Hong YM. Atherosclerotic cardiovascular disease beginning in childhood. Korean Circ J 2010;40:1-9.
3. Sorensen KE, Celermajer DS, Georgakopoulos D, Hatcher G, Betteridge DJ, Deanfield JE. Impairment of endothelium-dependent dilation is an early event in children with familial hypercholesterolemia and is related to the lipoprotein (a) level. J Clin Invest 1994;93:50-5.
4. Hill JO, Wyatt HR, Reed GW, Peters JC. Obesity and the environment: Where do we go from here? Science 2003;299:853-5.
5. Dietz WH. Overweight in childhood and adolescence. N Engl J Med 2004;350:855-7.
6. Meyer AA, Kundt G, Steiner M, Schuff-Werner P, Kienast W. Impaired flow-mediated vasodilation, carotid artery intima-media thickening, and elevated endothelial plasma markers in obese children: The impact of cardiovascular risk factors. Pediatrics 2006;117:1560-7.
7. Balagopal P, George D, Sweeten S, Mann KJ, Yarandi H, Mauras N, *et al*. Response of fractional synthesis rate (FSR) of fibrinogen, concentration of D-dimer and fibrinolytic balance to physical activity-based intervention in obese children. J Thromb Haemost 2008;6:1296-303.
8. Reinehr T, Kiess W, de Sousa G, Stoffel-Wagner B, Wunsch R. Intima media thickness in childhood obesity: Relations to inflammatory marker, glucose metabolism, and blood pressure. Metabolism 2006;55:113-8.
9. Giordano P, Del Vecchio GC, Cecinati V, Delvecchio M, Altomare M, De Palma F, *et al*. Metabolic, inflammatory, endothelial and haemostatic markers in a group of Italian obese children and adolescents. Eur J Pediatr 2011;170:845-50.
10. McFarlin BK, Johnston CA, Tyler C, Hutchison AT, Kueht ML, Reeves R, *et al*. Inflammatory markers are elevated in overweight Mexican-American children. Int J Pediatr Obes 2007;2:235-41.
11. Faigenbaum AD, Myer GD. Exercise deficit disorder

in youth: Play now or pay later. Curr Sports Med Rep 2012;11:196-200.
12. Gortmaker SL, Lee R, Cradock AL, Sobol AM, Duncan DT, Wang YC. Disparities in youth physical activity in the United States: 2003-2006. Med Sci Sports Exerc 2012;44:888-93.
13. Mitchell JA, Pate RR, Dowda M, Mattocks C, Riddoch C, Ness AR, *et al*. A prospective study of sedentary behavior in a large cohort of youth. Med Sci Sports Exerc 2012;44:1081-7.
14. Hammond RA, Levine R. The economic impact of obesity in the United States. Diabetes Metab Syndr Obes 2010;3:285-95.
15. Popkin BM, Kim S, Rusev ER, Du S, Zizza C. Measuring the full economic costs of diet, physical activity and obesity-related chronic diseases. Obes Rev 2006;7:271-93.
16. Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. JAMA 2002;288:1728-32.
17. Kumanyika S, Jeffery RW, Morabia A, Ritenbaugh C, Antipatis VJ, Public Health Approaches to the Prevention of Obesity (PHAPO) Working Group of the International Obesity Task Force (IOTF). Obesity prevention: The case for action. Int J Obes Relat Metab Disord 2002;26:425-36.
18. Schonfeld-Warden N, Warden CH. Pediatric obesity. An overview of etiology and treatment. Pediatr Clin North Am 1997;44:339-61.
19. Rosenbaum M, Leibel RL, Hirsch J. Obesity. N Engl J Med 1997;337:396-407.
20. Watts K, Jones TW, Davis EA, Green D. Exercise training in obese children and adolescents: Current concepts. Sports Med 2005;35:375-92.
21. World Health Organisation. Global Recommendations on Physical Activity and Health. Geneva: World Health Organisation; 2010.
22. LeMura LM, Maziekas MT. Factors that alter body fat, body mass, and fat-free mass in pediatric obesity. Med Sci Sports Exerc 2002;34:487-96.
23. Murphy EC, Carson L, Neal W, Baylis C, Donley D, Yeater R. Effects of an exercise intervention using dance dance revolution on endothelial function and other risk factors in overweight children. Int J Pediatr Obes 2009;4:205-14.
24. Tjønna AE, Stølen TO, Bye A, Volden M, Slørdahl SA, Odegård R, *et al*. Aerobic interval training reduces cardiovascular risk factors more than a multitreatment approach in overweight adolescents. Clin Sci (Lond) 2009;116:317-26.
25. Montero D, Walther G, Perez-Martin A, Roche E, Vinet A. Endothelial dysfunction, inflammation, and oxidative stress in obese children and adolescents: Markers and effect of lifestyle intervention. Obes Rev 2012;13:441-55.
26. Hill JO, Wyatt HR. Role of physical activity in preventing and treating obesity. J Appl Physiol 2005;99:765-70.
27. Metcalf B, Henley W, Wilkin T. Effectiveness of intervention on physical activity of children: Systematic review and meta-analysis of controlled trials with objectively measured outcomes (Early Bird 54). BMJ 2012;345:e5888.
28. MOH. A Portrait of Health: Key results of the 2006/07 New Zealand Health Survey. Ministry of Health, 2008.
29. Bergin P. Maori sport and cultural identity in Australia. Aust J Anthropol 2002;13:257.
30. Te Rito P. Leadership in Māori, European cultures and in the world of sport. MAI Rev 2006;1:1-19.

Source of Support: Nil, **Conflict of Interest:** None declared.

International Journal of Preventive Medicine on Web

http://www.journalonweb.com/ijpvm

International Journal of Preventive Medicine now accepts articles electronically. It is easy, convenient and fast. Check following steps:

1 Registration

- Register from http://www.journalonweb.com/ijpvm as a new author (Signup as author)
- Two-step self-explanatory process

2 New article submission

- Prepare your files (Article file, First page file and Images, if any)
- Login into your area
- Click on 'Submit a new article' under 'New Article'
- Follow the steps (three steps for article without images and five for with images)
- On successful submission you will receive an acknowledgement quoting the manuscript numbers

3 Tracking the progress

- Click on 'In Review Article' under 'Submitted Articles'
- The table gives status of the article and its due date to move to next phase
- More details can be obtained by clicking on the Manuscript ID
- Comments sent by the editor and referee will be available from these pages

4 Submitting a revised article

- Click on 'Article for Revision' under 'Submitted Articles'
- Click on 'Revise'
- From the first window, you can modify Article Title, Article Type
- First Page file and Images could be modified from second and third window, respectively
- The fourth step is uploading the revised article file.
- Include the referees' comments along with the point to point clarifications at the beginning of the revised article file.
- Do not include authors' name in the article file.
- Upload the revised article file against New Article File - Browse, choose your file and then click "Upload" OR Click "Finish"
- On completion of revision process you will be able to check the latest file uploaded from Article Cycle (In Review Articles-> Click on manuscript id -> Latest file will have a number with 'R')

Facilities

- Submission of new articles with images
- Submission of revised articles
- Checking of proofs
- Track the progress of article in review process

Advantages

- Any-time, any-where access
- Faster review
- Cost saving on postage
- No need for hard-copy submission (except on acceptance images should be sent)
- Ability to track the progress
- Ease of contacting the journal

Requirements for usage

- Computer and internet connection
- Web-browser (preferably newer versions - IE 5.0 or NS 4.7 and above)
- Cookies and javascript to be enabled in web-browser

Online submission checklist

- First Page File (text/rtf/doc/pdf file) with title page, covering letter, acknowledgement, etc.
- Article File (text/rtf/doc/pdf file) - text of the article, beginning from Title, Abstract till References (including tables). File size limit 1MB. Do not include images in this file.
- Images (tiff): Submit good quality colour images. Each image should be less than 4096 kb (4 MB) in size

Help

- Check Frequently Asked Questions (FAQs) on the site
- In case of any difficulty contact the editor