J Pediatr (Rio J). 2013;89(6):575–582

Jornal de Pediatria
www.jped.com.br

ORIGINAL ARTICLE

Association of breakfast intake with cardiometabolic risk factors☆

Gita Shafiee[a,b], Roya Kelishadi[c], Mostafa Qorbani[d], Mohammad Esmaeil Motlagh[e,f], Majzobeh Taheri[f], Gelayol Ardalan[f], Mahnaz Taslimi[g], Parinaz Poursafa[c], Ramin Heshmat[a,b,*], Bagher Larijani[b]

[a] *Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran University of Medical Sciences, Tehran, Iran*
[b] *Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Research Institute, Tehran University of Medical Sciences, Tehran, Iran*
[c] *Department of Pediatrics, Child Growth and Development Research Center, Isfahan University of Medical Sciences, Isfahan, Iran*
[d] *Department of Public Health, Alborz University of Medical Sciences, Karaj, Iran*
[e] *Department of Pediatrics, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*
[f] *Bureau of Population, Family and School Health, Ministry of Health and Medical Education, Tehran, Iran*
[g] *Bureau of Health and Fitness, Ministry of Education and Training, Tehran, Iran*

Received 14 February 2013; accepted 13 March 2013
Available online 9 September 2013

KEYWORDS
Breakfast consumption;
Metabolic syndrome;
Cardiovascular risk factors

Abstract
Objective: this study aimed to evaluate the association of breakfast intake with cardiometabolic risk factors in a nationally-representative sample of Iranian pediatrics.
Methods: the study participants considered of 5,625 school students aged 10-18 years, studied in the third survey of the national school-based surveillance system (CASPIAN-III). They were classified into three groups based on the number of days they ate breakfast: ''regular breakfast eater'' (6-7days/week), ''often breakfast eater'' (3-5days/week), and ''seldom breakfast eater'' (0-2 days/week). Metabolic syndrome (MetS) was defined based on the Adult Treatment Panel III (ATP III) criteria modified for the pediatric age group. Moreover, high total cholesterol, high low-density lipoprotein cholesterol (LDL-C) and generalized obesity were included as other cardiometabolic risk factors. Multiple logistic regression analyses were used to evaluate the association between the breakfast intake category and cardiometabolic risk factors.
Results: the number of subjects classified as ''regular'', ''often'' and ''seldom'' breakfast eaters were 2,653(47.3%), 1,327(23.7%) and 1,624(29.0%), respectively. The average of triglycerides (TG), LDL-C, systolic blood pressure (SBP) and body mass index (BMI) were higher in the ''seldom breakfast eater'' group (P for trend<0.001), whereas the mean of high-density lipoprotein cholesterol (HDL-C) was lower in this group than their other counterparts. Seldom breakfast eaters had an increased risk of obesity, elevated TG and LDL-C, as well as low HDL-C compared to ''regular breakfast eaters''. The risk of MetS was significantly increased in subjects who seldom ate breakfast (OR 1.96, 95% CI 1.18-3.27).

☆ Please cite this article as: Shafiee G, Kelishadi R, Qorbani M, Motlagh ME, Taheri M, Ardalan G, et al. Association of breakfast intake with cardiometabolic risk factors. J Pediatr (Rio J). 2013;89:575–82.

* Corresponding author.
E-mail: rheshmat@tums.ac.ir (R. Heshmat).

http://dx.doi.org/10.1016/j.jped.2013.03.020

Conclusions: skipping breakfast is associated with increased risk of MetS and other cardiometabooic factors in children and adolescents. Promoting the benefit of eating breakfast could be a simple and important implication to prevent these risk factors.

PALAVRAS-CHAVE
Consumo de café da manhã;
Síndrome metabólica;
Fatores de risco cardiovascular

Associação de consumo de café da manhã com fatores de risco cardiometabólico

Resumo

Objetivo: O objetivo deste estudo foi avaliar a associação do consumo de café da manhã com fatores de risco cardiometabólico em uma amostra representativa, em termos nacionais, de pacientes de pediatria iranianos.

Métodos: Os participantes do estudo, composto de 5.625 alunos em idade escolar de 10-18 anos, participaram da terceira pesquisa do sistema nacional de vigilância nas escolas (CASPIAN-III). Eles foram classificados em três grupos, com base na quantidade de dias em que consumiam café da manhã: ''indivíduos que consomem café da manhã regularmente'' (6-7 dias/semana), ''indivíduos que consomem café da manhã normalmente'' (3-5 dias/semana) e ''indivíduos que consomem café da manhã raramente'' (0-2 dias/semana). A síndrome metabólica (SM) foi definida com base nos critérios do III Painel de Tratamento de Adultos (ATP III), adaptados para a faixa etária pediátrica. Ademais, o colesterol total elevado, a lipoproteína de baixa densidade-colesterol elevada (LDL-C) e a obesidade generalizada foram incluídos como outros fatores de risco cardiometabólico. As análises de regressão logística múltipla foram utilizadas para avaliar a associação entre a categoria consumo de café da manhã e fatores de risco cardiometabólico.

Resultados: A quantidade de pessoas classificadas como indivíduos que consomem café da manhã ''regularmente'', ''normalmente'' e ''raramente'' foram 2.653 (47,3%), 1.327 (23,7%) e 1.624 (29%), respectivamente. As médias de triglicerídeos (TG), LDL-C, pressão arterial sistólica (PAS) e índice de massa corporal (IMC) foram mais elevadas no grupo de ''indivíduos que consomem café da manhã raramente'' (P para tendência < 0,001), ao passo que a lipoproteína de alta densidade-colesterol (HDL-C) foi menor nesse grupo que nos outros. Os indivíduos que consomem café da manhã raramente apresentaram um aumento no risco de obesidade, TG e LDL-C elevados, bem como baixo HDL-C em comparação a ''indivíduos que consomem café da manhã regularmente''. O risco de SM foi significativamente maior nos indivíduos que consomem café da manhã raramente (RC 1,96, 95% IC 1,18-3,27).

Conclusões: Pular o café da manhã está relacionado a aumento no risco de SM e outros fatores cardiometabólicos em crianças e adolescentes. Promover o benefício do consumo do café da manhã pode ser uma implicação simples e importante para evitar esses fatores de risco.

Introduction

Chronic diseases have emerged as a rapidly increasing public health problem in developing countries.[1] Interest in childhood precursors to chronic diseases, particularly cardiovascular disease (CVD), is increasing because both behavioral and biological risk factors of such diseases persist from childhood into adulthood, and the several cardiometabolic risk factors, including obesity, dyslipidemia and metabolic syndrome (MetS), are followed from childhood to adult life and diseases.[2,3]

Some behavioral variables, including physical inactivity, unhealthy dietary habits, smoking and skipping meals, mainly breakfast, are associated with the development of CVD in later life.[4]

Breakfast is an important consumption for maintaining adequate intake and health for children and adolescents.[5] It is estimated that children consume about twenty percent of their daily energy intake at breakfast.[6] Breakfast consumption has been associated with intake of most vitamins and minerals and improved diet quality in children and adolescents.[7] One dietary pattern that has an important role in maintaining normal weight in children and adolescence is the consumption of breakfast.[8] Some studies have reported a lower risk of overweight and obesity among children having breakfast regularly compared with those frequently skip it.[9,10] Research reveals that not only is breakfast consumption important, but also that the frequency of breakfast may be an important factor influencing weight.[11]

Similar to many other developing countries, the epidemiologic transition along with rapid lifestyle changes has made Iranian children prone to cardiometabolic risk factors, and, as a result, to chronic diseases in adulthood.[12,13] Consequently, for the first time in Iran, we determined the association of breakfast pattern with cardiometabolic risk factors in a large nationally-representative sample of children and adolescents.

Materials and methods

The data used in this study was obtained as a part of the third survey of the school-based surveillance system entitled