Childhood Obesity in Japan: A Growing Public Health Threat

Abdul Jalil Rohana, Naomi Aiba
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ABSTRACT

Background & objective: Childhood obesity in Japan is rising up perpendicular to the obesity in adult. It is a growing public health concern that will be reaching epidemic levels. Obesity in Japanese children was prominent with other complications such as hypertension, serum lipid disorder and fatty liver, especially during later life in adulthood. 'Tracking' of obesity in children is useful to predict serious complications in adult obesity, even though the effect of overweight on mortality and morbidity has not been well documented. Previous studies suggested that obesity during childhood will be accompanied by serious health complications in later adult phases.

Methods: A review of literature on previous studies related to the prevalence of obesity in children and factors associated particularly for Japan scenario were gathered and summarized.

Results: Most studies showed due to the remarkable improvement of socioeconomic development in Japan affected eating habits and lifestyles among Japanese children. Irregular food intake is an important issue, in other words children tend to skip their main meals especially breakfast. Rapid shift from enjoying traditional food toward Westernized diet was closely associated with metabolic syndrome and other co-morbidities. Apart from that, sedentary lifestyles among today's Japanese children particularly lack of physical activity led to the increasing trend of obesity.

Conclusion: Obesity in Japanese children became a threat because of poor quality of life and metabolic syndrome such as hyperlipidemia, abnormal glucose tolerance and hypertension. A strong relationship between obesity and prevalence of diabetes mellitus became more prominent coupled with unhealthy lifestyles among children. Hopefully, the active promotion of food education Shokutuka will prevent chronic childhood obesity in Japan especially during school lunch program. In general, programs aimed to increase activity levels may be helpful to combat childhood obesity problem worldwide.

KEY WORDS

childhood obesity, metabolic syndrome, breakfast skipping

TREND OF CHILDHOOD OBESITY IN JAPAN

Childhood obesity in Japan is currently the most serious public health threat¹. The problem has been growing gradually²,³ and reaching epidemic levels⁴,⁵. The Japanese experience suggested that the prevalence of childhood obesity rises perpendicularly to the increase in adult obesity⁶. In the past 20 years, prevalence of childhood obesity in Japan has increased remarkably from 5.0% to 20.0%⁷,⁸,⁹ though report or surveys about this trend of prevalence among Japanese children were very scarce⁴,⁵,¹⁰. Apart from lacking English publications on prevalence and incidence of obesity among Japanese children, descriptive analysis or further results also limited due to the inconvenience of accessing the whole datasets⁶. A 10-year study on obese children of elementary school and junior high school in Akita City from 1993-2002 has been carried out. The study reported their findings in terms of ratio of obese children to school enrolment⁶. As this study reported its findings in term of ratio, again no extensive data or further analysis on epidemiological aspects of obesity in children can be revealed⁹ even with data derived from school health statistics⁶.

A study on incidence of childhood obesity in Tatemaya City as a typical Japanese country city was carried out. Obesity in children particularly amongst boys aged 11 to 13 years old was prominent with other health complications such as hypertension, serum lipid disorder and fatty liver⁴. Although the effect of overweight and obesity on morbidity and mortality in children was not well documented, several studies suggested that obesity in childhood will be accompanied by serious complications later in adult phases¹ⁱ because childhood obesity often led to the adulthood obesity⁰. Researchers have been keeping on track regarding the impact of overweight in children in later life for many years¹²,¹³. The same phenomenon could be seen in a study predicting obesity in adult in later life among children where 85.0% of light obesity led to adult obesity¹⁴. Through two decades of annual medical examinations for 22 years plus a follow-up study with larger sample size of obese children (n = 13,1186) in Osaka, Japan. Frequency of obese children increased from 5.0% to more than 10.0% for extremely obese category, particularly in boys which increased from 1.0% to more than 2.0% within this long period. In general, childhood obesity was increasing especially in boys. Approximately 32.0% of obese boys and 41.0% girls will grow into obese adults, respectively⁶. Childhood obesity was found to be positively correlated with eventual adult obesity⁶. However, in contrast with a findings from a study⁶ indicated an overweight birth cohort in childhood does not necessarily continue to be overweight as young adult. Body mass index decreased in preschool children (2 to 5 years), increased in children (6-12 years) and adolescents (14 to 18 years) and slightly decreased during young adults (19-25 years) among Japanese girls and women from the same birth cohort. The most recent of 30 years of cross-sectional analysis among children aged 5 to 17 years in Japan showed

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the highest prevalence of obesity was in the late 1990s to early 2000s, except for the 17 years old boys). Obesity in children also have been reported in developing countries counterpart of Asia, however, in the trend of prevalence of obesity in Japan is currently rising up and led to obesity during adult (21). Overweight and obesity at birth were significantly related to the development of obesity in the samples of 3-year-old children during the routine health check-ups by local governments in Japan (22). Undoubtedly, one third of obese children in Japan will grow into obese adults (23). Evidence of relationship between childhood obesity and prediction of adult obesity were shown in Ishikawa Prefecture, Japan (24). In longitudinal study from birth, body mass index in young adults was strongly related to their previous body mass index while they were childhood. Approximately 30.0% of obese children remain obese in adults (25).

Breakfast skipping among Japanese children

Japan experienced remarkable improvement in socioeconomic development, and underwent many changes within the culture after World War II. Changes in lifestyle and eating habits of Japanese children had greatly affected their health status and body size since the post-war period. Changes of physical appearance were reported extensively in School Health Program in annual report by Ministry of Education, Culture, Sports, Science and Technology since 1990 (26). These nationwide study also discussed the analyzed results on the effects of changes in eating habits toward health among Japanese children (27). The most important issue being emphasized is irregular food and breakfast habits. Report regarding breakfast consumption has been well documented worldwide where children and adolescents skipped breakfast more than any meal since 1970s and this trend growing in 1980s until now (28). Breakfast is the most important meal of the day and yet it is the meal most often missed (29). Breakfast skipping was more likely to be overweight or obesity in children (30), particularly among females (31). In one baseline study breakfast skipping was associated with overweight among children aged 9 to 14 years (32). Breakfast consumption and it's relation to overweight in children also has received particularly interest in Japan (33). Several studies have shown that those who consumed breakfast have a lower body mass index (34) and lower prevalence of overweight (35). A survey was carried out to study relationship between breakfast skipping habit and obesity in 10,450 children aged 3 to 12 years old born in Toyama Prefecture. It was found that the percentage of breakfast skipping habit was 25.3% among those children and 8.1% among 6 years old, while among the 9 years and 12 years were 7.0% and 12.7%, respectively. In total, Owing to every stage of age group, 53.1% of respondents skipped breakfast. Surprisingly, the incidence of obesity was significantly higher at the age of 9 and 12 years old. Breakfast skipping has been associated significantly to late bedtime, short sleeping duration, frequent late-night snack, frequent of eating out, frequent of eating instant noodles and eating breakfast alone at home (36). Children who seldom taking breakfast were more likely to have poor quality of life than who had daily breakfast. Furthermore, unfavorable lifestyles are associated with poor quality of life in their adolescent after 3 years follow-up of the Toyama Birth Cohort Study (37). Skipping breakfast was also associated with dysmenorrhea in Japanese young women (38). Breakfast skippers may be less engaged in physical activity, hence led to positive energy balance and weight gain (39). Out of 16 studies reviewed, 12 studies showed the association between breakfast skipping and increased of body mass index in children (40) and adolescent (41). Breakfast skipping and its association with long duration of television watching have been reported on Japanese children age 6 and above (42). The role of breakfast in promoting cognitive and academic performance, psychosocial functioning and school attendance has been investigated widely (43) as well as it’s association to emotion and self-esteem (44). Similar findings was reported among fifth grade elementary school in Toyama Prefecture, Japan. The everyday eating group showed higher family cohesion, lower delinquent behavior and improved quality of life (45). As breakfast skipping or skipping breakfast always interchangeably, therefore operational definition of breakfast eating should be considered (46). Even there were many studies have tried to link between breakfast skipping and obesity (47). Studies of breakfast skipping are still ambiguous and should be operationalized (48).

Metabolic syndrome and co-morbidities among Japanese obese children

Overweight and obesity in Japanese children has been shown to exist with other co-morbidities which include metabolic syndrome, hyperlipidemia, abnormal glucose tolerance and hypertension (49). Overweight children in Japan were increasing in the prevalence of obesity as well as hyperlipidemia (50). However, during that period, there was no specific national guidelines for interventions to reduce risk of childhood coronary heart disease, despite previous studies found increased serum cholesterol concentrations increased during the past three decades among Japanese children (51). The incidence of obesity in children and hyperlipidemia in Japan were more likely to develop cardiovascular and digestive disease at the age of 45 during follow-up assessment (52). Similar to adults, increase in plasma triglyceride levels, decreased of high density lipoprotein and elevated blood pressures can be found in more marked degrees of obesity in children (53).

In Western countries, Japanese children who lived in urban area showed total plasma and LDL cholesterol levels higher than U.S children. Initial hypothesis of this study that stated the population who were not previously exposed to Western diet and lifestyles may have more adverse effect on expression of cardiovascular risk factors compared than other groups were rejected (54). Overweight and obesity were associated with substantial elevations of total cholesterol, LDL and Type 2 diabetes, although mean concentration of plasma HDL cholesterol was comparatively higher for Japanese schoolchildren than Australian or U.S schoolchildren (55).

A recent report of a study among Japanese children from 1993 to 2001 found an increase in the prevalence of obesity as well as hyperlipidemia (56). However, during that period, there was no specific national guidelines for interventions to reduce risk of childhood coronary heart disease, despite previous studies found increased serum cholesterol concentrations increased during the past three decades among Japanese children (57). The incidence of obesity in children and hyperlipidemia in Japan were more likely to develop cardiovascular and digestive disease at the age of 45 during follow-up assessment (58). Plasma fibrinogen level as a major contributor factor to blood viscosity and cardiovascular risk factors were significantly associated with increase of body mass index among 10 to 13 years children in Nagano Prefecture (59). Other similar study in Kagoshima Medical Center indicated the tendency toward early development of cardiovascular in mild obesity among children aged 6 to 12 years old (60).

A strong relationship between overweight and metabolic syndrome has been reported elsewhere (61). Prevalence of metabolic syndrome in Japanese obese children was significantly lower (17.7%) than American obese children (28.7%). However, among overweight children, Japanese children were having prevalence of metabolic syndrome comparable with American overweight children (62). The recent study on prevalence of metabolic complications amongst severely obese Japanese children in Tokushima showed the prevalence of each abnormality in obese children was relatively high compared with general population. Especially, the incidence of insulin resistance as well as the incidence of 80.4% of severely obese children had at least one complication (63). Type 2 diabetes in the young is an emerging epidemic (64) and it is significantly linked to obesity (65). Obesity has been shown to be associated with behavior such as diet, physical activity and other aspect of lifestyle in children. The increased incidence of obesity is parallel to the increase of diabetes in Japanese children where; almost 4.0% of children aged 6 to 15 were obese with increasing incidence of diabetes in Tokyo (66). The incidence of Type 2 diabetes was, 2.3, 3.5 and 8 per 100,000 children through annual screening for diabetes (67). A year later similar trend was revealed by children in Yokohama and Osaka. Furthermore, in Japanese youth with Type 2 diabetes were obese and have a family history of diabetes (68). Type 1 diabetes in Japanese children is not a uniform disease (69). The urinary screening system for school children has been implemented for more than 20 years (70) by the Ministry of Education, Culture, Sports, Science and Technology (71), however, the growing incidence of Type 2 diabetes and obesity present a worrying trend in Japanese children (72).

Sedentary lifestyles among Japanese children

Today's Japanese children are facing serious problems of sedentary lifestyle. One particular lack of physical activity, which led to increasing trend of obesity (73). Barriers of physical activity may include lack of indoor entertainment such as television and computer games was also found to be associated factors contribute to obesity in Japanese children (74). A study carried out among 9,668 Japanese children in Toyama Prefecture showed irregular snack intake, physical inactivity and reduced sleeping hours were significant related lifestyle variables for children (75). In addition, a study conducted to determine the prevalence of obesity in relation to dietary intake and physical activity in elementary schoolchildren living in the city area of
CONCLUSION

Childhood obesity is growing in Japan, where 10.0% of children are currently obese. Prevalence of obesity was approximately 70.0% among elementary schoolchildren. Therefore, medical and health professionals should cooperate with policy makers, school teachers, mass media and food industries for a future health of children as well as review the new food education called 'Shokoku' in Japan. Parallel to 'Health Japan 21' which was recently established by the Ministry of Health, Labour and Welfare, hopefully this newly enacted law regarding nutrition education can be targeted to the schoolchildren especially during school lunch hours. On the other hand, programs aimed to increase activity levels may help to combat obesity in children. Program 'Trim and Fat' carried out in Singapore is a good model which can be implemented for Asian children where it led to the fall in obesity prevalence from 16.0% to 14.0% among primary and secondary students.

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