The growing problems of dental caries and obesity: an Australian perspective

M. S. Hopcraft*[1] and S. Beaumont[2]

In brief

Shows that the prevalence of dental caries and obesity is growing, and placing an increasing burden on an already stretched public health system.

Suggests social media and public health campaigns should be used as an effective strategy in combating the constant marketing strategy of the sugar industry.

Highlights that dental professionals are well placed to be strong advocates both for individual behaviour change in patients and public health policy changes at the government level.

Preventable diet-related diseases such as dental caries and obesity are a growing global problem, causing a significant burden on public health systems. Although there has been good evidence for the links between sugar consumption and dental caries for many decades, we are now seeing stronger links implicating sugar in obesity. There is a growing worldwide movement to tackle these problems by targeting the consumption of sugar-sweetened beverages through a range of public policy measures.

Introduction

Diet related diseases are consuming an increasing proportion of health expenditure in many countries, and Australia is no exception. Dental caries, type II diabetes and obesity rates are increasing, and the burden of disease is creating challenges for public health professionals. There is a growing awareness in the community that more action needs to be taken to tackle these preventable diseases, but an apparent lack of demonstrated outcomes to this effect.

Recent attention in the media has highlighted the role sugar-sweetened beverages (SSBs) play in our health; however, despite a range of public health measures targeting marketing and restrictions on sales in schools, the intake of SSBs remains unacceptably high. There is a growing body of evidence of associations between higher and more regular SSB consumption and poorer health outcomes across a range of measures, including dental caries and obesity. It is this area where public health policy and advocacy must focus if we are to see any reversal of current trends.

[1]Clinical Associate Professor, Melbourne Dental School, The University of Melbourne, Australia; [2]Senior Dentist, Dental Health Service Victoria, Melbourne, Australia
*Correspondence to: Matthew Hopcraft
Email: m.hopcraft@unimelb.edu.au

Refereed Paper. Accepted 5 August 2016
DOI: 10.1038/sj.bdj.2016.723
©British Dental Journal 2016; 221: 379-381

Dental caries

Australia has gone through a period of significant improvement in dental health over the past 40 years. The dental health of children receiving treatment in Australian state and territory public dental health services has been monitored since 1977, when the mean DMFT for 12-year-old children was 4.8, and mean dmft for 6-year-old children was 3.1.[1] Although water fluoridation commenced in Australia in 1953, it wasn't until 1968 that major population centres such as Sydney and Perth became fluoridated. By 1977 when Melbourne introduced water fluoridation, more than 60% of the Australian population had access to fluoridated drinking water. From 1977 to the mid-late 1990s, caries experience declined dramatically, with mean DMFT for 12-year-old children reaching a low of 0.83 in 1998, and mean dmft for 6-year-old children reaching a low of 1.45 in 1996.[1] Since then, there has been a 61% increase in decay experience in 12-year-old children and 78% in 6-year-old children.[2] In 1999, 59% of 6-year-old children had no clinically detectable caries experience in deciduous teeth, and 65% of 12-year-old children had no clinically detectable caries experience in permanent teeth.[3] By 2009, a new pattern was emerging, with only 45% of 6-year-old children and 52% of 12-year-old children being caries-free.[2] In addition, there are significant disparities in the oral health among Australian children, with the majority of disease concentrated in a small percentage of the population. In 2009, 10% of 12-year-old children had a mean DMFT of 4.83, nearly six times the national average.[2] It also appears that these social disparities are actually worsening over time.

Access to appropriate and timely dental care is becoming more difficult for many of the most disadvantaged and needy. Early identification of those at highest risk of dental disease and appropriate management is more necessary than ever. In 2013–14, there were 63,910 hospitalisations due to dental causes in Australia, second only to urinary tract infections and accounting for 10.6% of all preventable hospitalisations.[4] These hospital admissions for potentially preventable dental conditions place a significant drain on the public hospital system, and are an important indicator both of the magnitude of the dental caries problem, and a failure of the dental care system to meet the increasing demand.

It is not clear yet whether there has also been an increase in caries experience in adults, since there is not the level of population level data surveillance for Australian adults that there is for children. However, consecutive studies of caries experience in Australian Army recruits shows an increasing trend in mean DMFT for subjects aged 17-20 and 21-25 years between 2002 and 2008.[5]

Overweight and obesity

Overweight and obesity are becoming a significant problem in Australia, where they are currently the second highest contributor to the

© 2016 British Dental Association. All rights reserved.

burden of disease.[6] At present, 1 in 4 Australian children, and nearly 2 in 3 adults are obese or overweight (35% overweight, 28% obese).[7] Furthermore, the prevalence of obesity and overweight has been increasing, with 10% more adults overweight or obese in 2012 compared to 1995.[7,8] Disturbingly, much of this increase has been driven by an increase in obesity from 19% to 28% between 1995 and 2012, with the prevalence of overweight (but not obese) adults remaining relatively static (36% to 38%).

Like dental caries, there is a socioeconomic gradient, with 63% of women in the lowest socioeconomic group being overweight or obese, compared with only 47% of those in the highest socioeconomic group, although the proportions of overweight or obesity are similar in each socioeconomic group for men.[9] Australia's rate of obesity among adults is fourth highest among 34 OECD countries, behind only the United States, Mexico and Hungary.[9]

Results from the 2011-12 Australian Health Survey show that 25% of children aged 2–17 are overweight or obese, with 18% being overweight and 7% obese.[7] The prevalence of overweight and obesity is similar across age groups, from 23% for children aged 2–4 to 27% for adolescents aged 12–15. Boys aged 5–7 have the highest obesity rate (9%), and obesity among girls is most common at ages 5–7 and 16–17 (8%). There was a reasonably large increase in the prevalence of overweight and obesity between 1995 (21%) and 2008 (25%), but it has plateaued since then.

Economic impact of dental caries

Diet related diseases are consuming a proportion of health expenditure in many countries, and Australia is no exception. Oral health expenditure in 2013-14 was approximately $9 billion, and dental caries is a major contributor to this.[10] The government spent $89.7 million on restorative services and $19.6 million on tooth extractions under the Child Dental Benefit Schedule for children aged 2–17 years in 2015-16.[11] The total direct cost for overweight and obesity in 2005 was estimated to be $12 billion ($6.5 billion for overweight and $14.5 billion for obesity), with indirect costs of $35.6 billion per year.[12]

Sugar-sweetened beverages

In 2009, Australia was among the top ten highest consumers of sugar-sweetened beverages globally, and although there are limited recent data quantifying Australian sugar-sweetened beverage consumption, the available data suggest that children are heavy consumers from an early age.[13,14] Annual sales of soft drinks have increased substantially over the past five decades, with apparent consumption increasing from 45 litres per capita in 1969 to 120 litres per capita in 1999.[15] The 2007 Australian National Children's Nutrition and Physical Activity Survey found that 47% of children aged 2-16 years consumed SSBs daily.[16] In the past decade it appears that consumption of sugar-sweetened soft drinks has decreased, to around 89 litres per capita in 2014.[17] Although there has been a decline in consumption of sugar-sweetened soft drinks, the sale of other sugar-sweetened beverages has increased.[18,19]

In 2015 McNeill and Shrapnel reported that apparent consumption of refined sugars in Australia fell 13.1% from 48.3 to 42 kg per head from 1938 to 2011.[20] However, the data reported in that study suggest that consumption over the most recent decade has plateaued or perhaps even increased slightly.

What is being done?

Over recent years there has been a considerable push from a public health perspective to tackle some of these problems. Much of the emphasis has been on childhood obesity, which may in part be a reflection of the magnitude of the problem, but also an indictment on dental health advocates to adequately bring oral health to the forefront of public consciousness. However, it is unclear what impact if any these public health campaigns are having.

Australian Health Ministers recognised in 2002 that overweight and obesity were significant public health problems, and established the National Obesity Taskforce to develop an obesity action plan. This led to the introduction of a $116 million campaign to tackle the problems of declining physical activity and poor eating habits of Australian children.[21] However, the government at that time was opposed to more 'radical' policy options such as banning junk food advertising during children's television. In 2008, a new federal government established the National Preventative Health Taskforce to develop strategies relating to tobacco, alcohol and obesity. The subsequent Australian National Preventive Health Agency was shut down in 2014.

Live Lighter (www.livelighter.com.au) is a campaign that originated in Western Australia in 2012, and has recently been adopted by Victoria and the Australia Capital Territory. The programme is supported by State health departments, the Cancer Council and Heart Foundation. It is primarily targeted at members of the public, and focuses on obesity and overweight through promotion of healthy eating and exercise.

In 2013 the Rethink Sugary Drink (www.rethinksugarydrink.org.au) campaign was launched, bringing together a number of peak bodies, including the Cancer Council, Diabetes Australia, Heart Foundation, Australian Dental Association, Dental Hygienists Association of Australia, Kidney Health, Nutrition Australia, Obesity Policy Coalition and the Stroke Foundation. They recommend comprehensive action by governments, schools and non-government organisations to inform the public about the health impacts of sugar-sweetened beverages and to influence the public to limit their consumption. This includes measures such as social marketing campaigns, a sugar-sweetened beverage tax, restrictions on marketing to children, restrictions on the sale of sugar-sweetened beverages in government schools and children's activity centres and policies to limit availability of sugar-sweetened beverages in workplaces, healthcare settings and other public places.

Corporations are clearly concerned about the groundswell of opposition to their products, and are reacting accordingly. In 2008, Coca Cola engaged a local actress to feature in an advertisement claiming to shatter the myths about the harm that soft drink was alleged to cause. The Australian Dental Association, Obesity Policy Coalition and Parents Jury lodged a complaint with the Australian Competition and Consumer Council, who found that the messages delivered in the advertisement 'were totally unacceptable and misleading' and forced Coca Cola to retract the claims in full page newspaper advertisements.[22]

Conclusion

Dental caries and obesity rates have been increasing in Australian children over the past 20 years, and although there is no evidence of a direct link to sugar-sweetened beverages, there is no doubt that the growth in consumption of these drinks is an important contributing factor. Numerous public health campaigns have been instrumental in raising awareness of the obesity issue, although more needs to be done to ensure that oral health is given more prominence. It is now time for more radical policy initiatives such as a sugar tax and banning junk food advertising if we are to have any impact on the twin problems of dental caries and obesity.

© 2016 British Dental Association. All rights reserved.

The relationship between sugar and dental caries has been well documented and understood for many years but the dental profession has become increasingly complacent in getting this message out there. We are all responsible for tackling this insidious public health epidemic.

1. Mejia G C, Amarasena N, Ha D H, Roberts-Thomson K F, Ellershaw A C. Child Dental Health Survey Australia 2007: 30-year trends in child oral health. Dental statistics and research series no. 60. Cat. no. DEN 217. Canberra: AIHW, 2012.
2. Chrisopoulos S, Harford JE & Ellershaw A. Oral health and dental care in Australia: key facts and figures 2015. AIHW Cat. no. DEN 229. Canberra: AIHW, 2016.
3. Armfield J M, Roberts-Thomson KF, Spencer A J. The Child Dental Health Survey, Australia 1999: Trends across the 1990s. AIHW Cat. No. DEN 95. Adelaide: The University of Adelaide (AIHW Dental Statistics and Research Series No. 27), 2003.
4. Australian Institute of Health and Welfare 2015. Admitted patient care 2013–2014: Australian hospital statistics. Health services series no. 60. Cat. no. HSE 156. Canberra: AIHW, 2015.
5. Hopcraft M S, Yapp K E, Mahoney G, Morgan M V. Dental caries experience in young Australian Army recruits 2008. *Aust Dent J* 2009; **54:** 316–322.
6. Australian Institute of Health and Welfare (AIHW). Australia's health 2014. Australia's health series no. 14. Cat. no. AUS 178. Canberra: AIHW, 2014.
7. Australian Bureau of Statistics (ABS). Australian Health Survey: updated results, 2011–2012. ABS cat. no. 4: 364.0.55.003. Canberra: ABS, 2013.
8. Australian Institute of Health and Welfare (AIHW). Risk factor trends: age patterns in key health risk factors over time. Cat. no. PHE 166. Canberra: AIHW, 2012.
9. Australian Institute of Health and Welfare. Cardiovascular disease, diabetes and chronic kidney disease-Australian facts: Risk factors. Cardiovascular, diabetes and chronic kidney disease series no. 4. Cat. no. CDK 4. Canberra: AIHW, 2015.
10. Australian Institute of Health and Welfare. Health expenditure Australia 2013–2014. Health and welfare expenditure series no. 54. Cat. no. HWE 63. Canberra: AIHW, 2015.
11. Australian Government Department of Health. Medicare Australia Statistics 2014–2015. Available online at http://medicarestatistics.humanservices.gov.au/statistics/mbs_group.jsp (accessed Decemeber 2015).
12. Colagiuri S, Lee C M Y, Colagiuri R *et al.* The cost of overweight and obesity in Australia. *Med J Aust* 2010; **192:** 260–264.
13. Hector D, Rangan A, Gill T, Louie J, Flood V M. Soft drinks, weight status and health: A review. Sydney: NSW Health, University of Sydney, 2009.
14. Bell A, Kremer P, Magarey A M, Swinburn B. Contribution of 'noncore' foods and beverages to the energy intake and weight status of Australian children. *Euro J Clin Nutrition* 2005; **59:** 639–645.
15. Commonwealth Department of Health and Aged Care, Australian Institute of Health and Welfare. National Health Priority Areas Report: Cardiovascular health, A report on heart, stroke and vascular disease. Canberra: Australian Institute of Health and Welfare, 1998.
16. Department of Health and Ageing. 2007 Australian National Children's Nutrition and Physical Activity Survey. Commonwealth of Australia: Canberra, 2008.
17. Silver M. I'd like to buy the emerging world a coke. NPR (source Eurovision Monitor), 2015. Available online at http://www.npr.org/sections/goatsandsoda/2015/05/20/408027045/id-like-to-buy-the-emerging-world-a-coke (accessed Decemeber 2015).
18. Levy G, Tapsell L. Shifts in purchasing patterns of non-alcoholic water-based beverages in Australia, 1997–2006. *Nutrition Diet* 2007; **64:** 268–279.
19. Rangan A, Kwan J, Flood V, Louie Y C U, Gill T. Changes in 'extra' food intake among Australian children between 1995 and 2007. *Obes Res Clin Pract* **2011:** e55–e363.
20. McNeill T J, Shrapnel W S. Apparent consumption of refined sugar in Australia (1938–2011). *Eur J Clin Nutr* 2015; **69:** 1233–1237.
21. J Howard (Prime Minister), Building a healthy, active Australia, media release, 29 June 2010. Available online at http://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/I1ZC6/upload_binary/i1zc65.pdf (accessed September 2016).
22. Australian Competition and Consumer Commission. ACCC acts on Coca Cola myth-busting. 2009. Available online at http://www.accc.gov.au/media-release/accc-acts-on-coca-cola-myth-busting (accessed Decemeber 2015).

© 2016 British Dental Association. All rights reserved.