Tackling the obesity epidemic: new approaches

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Perspective on the paper by Rudolf *et al* (see page 736)

The epidemic of obesity in UK children and adolescents began in the mid to late 1980s.¹ As in other parts of the world, overweight and obesity have become very common, and prevalence continues to increase. The most recent nationally available data from within the UK come from the Health Survey for England 2004:² in 2–10 year olds 16% of boys and 12% of girls were obese (BMI $\geq$ 95th centile), and in 11–15 year olds a staggering 24% of English boys and 26% of English girls were obese in 2004.

SCALE AND IMPACT OF THE OBESITY EPIDEMIC

Though high, these estimates of obesity prevalence are probably conservative: a high BMI for age is a good simple means of diagnosing obesity in that it is characterised by high specificity (low false positive rate), but it is also characterised by modest sensitivity, a moderate false negative rate.^{3–4} This means that there are many children with an excessively high body fat content but with BMI below any recommended BMI cut-point for defining obesity, such as BMI $\geq$ 95th centile.^{3–4} There is a large body of evidence, systematically reviewed and critically appraised,^{5–6} showing that a high BMI for age is a better measure of obesity for clinical purposes, such as diagnosis of obesity in individual children, than for epidemiological applications such as surveillance of obesity. The other reason why current estimates of obesity prevalence using BMI are conservative, is the evidence on trends in increasing *body fat content* (as distinct from BMI) of British children,^{7–9} as well as increasing central adiposity (e.g. rapidly increasing waistlines of British children and adolescents).^{10–11} These increases in body fatness and in central fatness have probably affected much of the distribution, so that even the typical child is now fatter than in the recent past, with a more central fat distribution.¹² The British evidence on increases in body fat content (as distinct from BMI) of children is consistent with secular trends in fatness (not just BMI) of

Canadian children,¹³ as well as earlier publications on secular trends in indices of body fat content (such as skinfold thickness) from children in the USA.^{14–15} Taken together, this body of evidence indicates a pervasive phenomenon of rapid lifestyle change which has affected most of the children and adolescents in the developed world, not just those who might be defined as obese for clinical or epidemiological purposes.¹²

The BMI cut-points used to define obesity (e.g. BMI $\geq$ 95th centile) are also biologically/clinically meaningful.^{3–5–6} There is a large body of high quality and consistent evidence, systematically reviewed and critically appraised,^{3–5–6} that such definitions of obesity based on BMI successfully denote children and adolescents at high risk of morbidity. Obesity defined in this way has a range of adverse consequences, both for the obese child and for the adult who was obese as a child.^{3–5–6–16–17}

CLINICAL INTERVENTIONS FOR OBESITY

Despite the scale of the epidemic of paediatric obesity, and the major clinical and public health challenges it has created, systematic reviews/critical appraisal exercises have concluded repeatedly that we lack good evidence for specific interventions aimed at prevention or treatment.^{5–6–18–20} Furthermore,

there is abundant evidence that there is widespread ignorance of the impact of childhood obesity among health professionals, teachers, and parents.²¹ In addition, health professionals lack the confidence, time, and means (knowledge/resources/skills) to treat it effectively.^{22–24} Many treatment programmes are characterised by high patient non-attendance, high patient dropout, and lack of success.^{25–26} One final barrier to treatment and prevention of childhood obesity is the widespread, but probably incorrect,^{6–27} perception that interventions to treat childhood/adolescent obesity might do harm, and so it must be safer not to intervene.

Some “best bets” in treatment have been identified from the rather limited evidence base (see box 1).^{5–6–19} Ideally, treatment interventions should also be generalisable, and this includes the requirement that they are described in sufficient detail that they can be repeated. After all these requirements have been met, novel treatment interventions should be tested rigorously in randomised controlled trials (RCTs) which examine the outcome of the intervention in the medium to long term, ideally over at least one year.

THE “WATCH IT” INTERVENTION

Paediatric obesity is therefore a disease which is common and increasing, has a range of serious co-morbidities, and for which there are no simple interventions which are successful in prevention or treatment. It is against this grim background that new preventive or treatment interventions for childhood obesity should be seen. In this issue, Rudolf *et al*²⁸ describe the development and feasibility of a novel intervention aimed at community based treatment of paediatric obesity (BMI $>$ 98th centile). The WATCH IT treatment intervention described by Rudolf *et al*²⁸ appears to meet all of the criteria described above, and in the box. The intervention has

Box 1: Evidence based “best bets” in treatment of childhood obesity

- Treat the motivated child/family (who perceive obesity as a problem and appear willing to attempt lifestyle change)
- Treat in the context of the entire family, don't just focus on the individual obese child
- Spend more time on treatment (longer, more frequent appointments)
- Target changes in physical activity and sedentary behaviour (e.g. TV viewing), not just changes in diet
- Aim for weight maintenance (not weight loss) in most cases
- Ground the intervention in theory
- Use intervention methods which are supported by at least a little evidence of efficacy and acceptability (from pilot or feasibility studies, for example)

been designed to be relatively low cost (is delivered largely by non-health professionals); it targets not just diet but physical activity and sedentary behaviour; it has been described in some detail in the form of treatment manuals. As a result, the WATCH IT intervention is probably generalisable. The intervention has not arisen *de novo*, nor as a knee-jerk response to the epidemic, but has been developed via a methodical process of considering best evidence, and working with patients/families to develop acceptable forms of intervention which might bring about sustained behaviour change. Rudolf *et al* have also considered possible adverse effects of their intervention. In summary, the WATCH IT intervention appears to be a model for the development of new obesity treatment interventions, and the results of the ongoing RCT are eagerly awaited.

OUTCOMES OF TREATMENT INTERVENTIONS: IMPLICATIONS FOR RESEARCH AND CLINICAL PRACTICE

WATCH IT outcome data to date are preliminary and based not on RCTs but on short term outcomes (e.g. BMI SD score changes up to 6 months) derived from an uncontrolled study of those patients still attending clinics at 6 months. Rudolf *et al* report a statistically significant change from baseline in BMI SD score and are appropriately cautious about these preliminary results.²⁸ The biological/clinical significance of treatment effects of this magnitude is unclear. While there is a lack of evidence on the extent to which weight or BMI changes in obese youth “translate” to changes in the co-morbidities of obesity, the effect of the WATCH IT intervention seems modest.

Short term outcome data from interventions are usually biased in favour of the intervention because behaviour changes made in the short term are often not sustainable in the longer term.⁶ Assessment of outcomes based on participants who remain in the treatment programme are also likely to be biased. Biases in interventions with children and adults can also arise when subjective rather than objective methods are used to assess outcomes. There is good evidence of such self-report biases in dietary interventions with children,²⁹ as well as physical activity interventions.³⁰ Children (and/or their parents) tend to report favourable dietary or physical activity changes which may not be consistent with measurements made by more accurate and objective methods.^{29–30} In order to avoid “seeing the world through intervention coloured

glasses”,²⁹ objective methods should be used to assess outcomes where possible. For physical activity and sedentary behaviour, practical and accurate objective assessment of outcomes in children are possible using accelerometry.^{27–31}

The preliminary WATCH IT outcome data may appear to be disappointing in absolute terms but when considered relative to audits of the other clinical treatment programmes which have been reported recently in the UK and the USA,^{25–26} the results may be more positive. Rudolf and colleagues are justifiably optimistic about the possibility that WATCH IT might offer an improvement over existing treatment approaches.

Despite this promise, the (probable) modest impact of WATCH IT and other, more intense treatment programmes in the UK raises questions about the value of treatment, the type and duration of treatment necessary to achieve resolution of paediatric obesity in the long term, and whether the resources required are ever likely to exist to provide any such treatment for large numbers of obese children and adolescents. Childhood and adolescent obesity is highly resistant to treatment and we urgently need major shifts in our approach to treatment in order to treat it successfully on a more consistent and long term basis.

PREVENTION VERSUS TREATMENT?

The apparent failure of our clinical approaches to treating obesity has led some to suggest that our efforts to tackle the obesity epidemic should focus exclusively on prevention rather than treatment. This may seem to be a logical response to the scale of the obesity problem, but a simple obesity prevention versus treatment argument is not helpful for a number of reasons. First, large and increasing numbers of obese children and adolescents will present for treatment in future, and the increasing skewness of body fatness and BMI means that there will be an increase in “super obesity” among children and adolescents presenting for treatment. Second, obesity is already a major health burden for children and adolescents^{16–17} (also noted in the WATCH IT study²⁸), and many health professionals are unaware of, or even unsympathetic to this burden.³² Childhood obesity also contributes substantially to later (adult) health problems. It is therefore unethical as well as unwise not to offer treatment where treatment is sought. Third, from a public health perspective, treatment and prevention are indistinct in children and adolescents. For example, if an effective treatment

intervention were available for children it would prevent obesity in adolescence and adulthood, when the co-morbidities become even more common and more serious. Finally, systematic reviews and critical appraisals of the literature on obesity prevention in children and adolescents are scarcely any more encouraging than the reviews of treatment interventions: we lack clearly generalisable, successful, interventions backed by high quality evidence.^{5–6–19–27} Investing only in prevention strategies and abandoning efforts at treatment is therefore not a logical strategy. We need to be able to offer better treatment to the large and increasing number of patients presenting with obesity.

THE FUTURE OF TREATMENT

Some fairly novel approaches to treatment are promising, but are not yet backed by high quality evidence of long term outcomes. These include surgery,³³ pharmacotherapy combined with treatment aimed at lifestyle change,³⁴ the use of novel dietary targets such as modifying the glycaemic load of the diet,³⁵ and the use of residential treatment.³⁶ Some of these approaches may never be suitable for treatment of large numbers of patients and are likely to be restricted to use in adolescents and/or those with serious co-morbidity.

One strategy which might be considered in future is to focus treatment at an earlier stage on the pathway to obesity. This might include an emphasis on treating younger children, by attempting lifestyle change in patients in their pre-school or early school years, and/or treating overweight children (e.g. BMI ≥ 91 st or 85th centiles but < 95 th or 98th centiles) rather than just obese children. Overweight children are presumably at high risk of becoming obese, overweight is associated with increased risk of morbidity,¹⁷ and lifestyles of overweight children may be more amenable to modification than those of obese children. Treatment of obesity in childhood also needs to be considered as a long standing problem which may need years of intervention rather than our more traditional approach of weeks/months of low intensity intervention in the form of short clinic consultations.

Cochrane reviewers have drawn attention to the enormous mismatch between the scale of the paediatric obesity problem and the limited evidence base on intervention strategies to tackle it.^{18–19} Addressing this mismatch will require a much greater research focus on developing treatment (and prevention) interventions, and in testing these rigorously. This in turn will require much greater research effort, and funding, directed at intervention

studies, which should therefore be a high priority for research funding bodies and the research community in general.³⁷ In the UK, several RCTs of treatment and prevention interventions are underway and so the evidence base will improve substantially in relative terms, but in absolute terms the number and range of interventions being tested is still very small. This means that progress in the near future will be limited, particularly against the backdrop of continued increases in obesity prevalence. Greater efforts to publish audits of existing treatment programmes may also be helpful in developing improved approaches to treatment in clinical settings.

SOCIETAL TREATMENT AND PATIENT TREATMENT?

Treating the societal problem of increasing fatness and central fatness among children and adolescents will probably require more radical attempts to alter the "obesogenic environment" than have been considered to date. Abnormal body composition among contemporary children (secondary to obesogenic lifestyles which are increasingly being adopted early in life^{38, 39}) is the product of a complex web of influences, many of which operate at a "macro" level, beyond the control of the individual child or family.⁴⁰ Our efforts to treat obesity in individual families to date have been worthy and necessary, but we should perhaps see them as attempts to treat the symptoms of the underlying societal disease, rather than the disease itself.

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