

A systematic review of the routine monitoring of growth in children of primary school age to identify growth-related conditions

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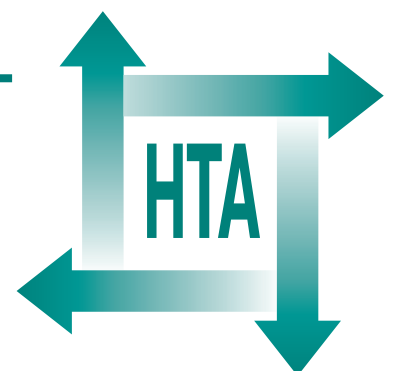
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Executive summary

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Executive summary

Background

Assessment of children's height and weight is well established as an indicator of their general health and well-being. Monitoring height and weight to identify growth disorders, including obesity, might be a useful exercise. The current role of growth monitoring is unclear and uncertainties exist as to the most appropriate age(s) to measure and the measurement strategies to adopt.

Objectives

The aim of this review was to clarify the role of growth monitoring, including obesity, and to examine issues that might impact on the effectiveness and cost-effectiveness of such programmes. The objectives were to:

- determine the detection rate, age at diagnosis and route to diagnosis of the target growth-related conditions in the UK population
- determine the clinical effectiveness of growth monitoring in terms of the age of diagnosis and management/outcome of children
- determine the diagnostic performance of growth monitoring strategies for the identification of growth related conditions
- evaluate any evidence of human resource requirement of growth monitoring programmes
- evaluate any evidence of attitudes of children, parents and health care professionals to growth monitoring
- determine the likely cost-effectiveness of routine growth monitoring.

Methods

Data sources

Studies were identified through extensive searches of electronic databases up to July 2005, handsearching of journals, scanning reference lists of included papers and consultation with experts in the field.

Study selection

Two reviewers independently screened titles and abstracts for relevance. Full papers of potentially relevant studies were assessed for inclusion by one

reviewer and checked by a second. Published and unpublished studies in any language were eligible for inclusion.

Inclusion criteria

Separate inclusion criteria, relating to study design, participant characteristics and outcome measures, were derived for each objective.

Data extraction

Data extraction and quality assessment were performed using standardised forms. The quality of the included studies was evaluated using specially designed or standard checklists according to study type. Data extraction was checked by a second reviewer.

Data synthesis

Data were analysed separately for each of the phases of the review. Results were presented in tables and synthesised narratively. The performance of growth monitoring to detect disorders of stature and obesity was evaluated against National Screening Committee (NSC) criteria.

Results

Monitoring for stature-related disorders

Thirty-one studies were included in the review. There were no controlled trials of the impact of growth monitoring and no studies of the diagnostic accuracy of different methods for growth monitoring. Analysis of the studies that presented a 'diagnostic yield' of growth monitoring suggested that one-off screening might identify between 1:545 and 1:1793 new cases of potentially treatable conditions. Economic modelling suggested that growth monitoring is associated with health improvements [incremental cost per quality-adjusted life-year (QALY) of £9500] and indicated that monitoring was cost-effective 100% of the time over the given distributions for a willingness to pay threshold of £30,000 per QALY.

Monitoring for obesity

Studies of obesity focused on the performance of body mass index against measures of body fat.

A number of issues relating to human resources of growth monitoring were identified, but data on attitudes to growth monitoring were extremely sparse. Preliminary findings from economic modelling suggested that primary prevention may be the most cost-effective approach to obesity management, but the model incorporates a great deal of uncertainty.

Conclusions

This review has indicated the potential utility and cost-effectiveness of growth monitoring in terms of increased detection of stature-related disorders. It has also pointed strongly to the need for further research.

Implications for policy and practice

Monitoring for stature-related disorders

Growth monitoring does not currently meet all NSC criteria. However, it is questionable whether some of these criteria can be meaningfully applied to growth monitoring given that short stature is not a disease in itself, but is used as a marker for a range of pathologies and as an indicator of general health status. There is a need to consider the extent to which it is appropriate to evaluate growth monitoring against NSC criteria. Those considering implementing growth monitoring programmes may need to consider whether the potential for earlier detection of stature-related disorders outweighs the lack of information on other relevant NSC criteria. It may be useful to consider the potential benefits of growth monitoring in the context of overall child health and the potential to detect other important, treatable disorders.

Monitoring for obesity

Identification of effective interventions for the treatment of obesity is likely to be considered a prerequisite to any monitoring programme designed to identify individual overweight and obese children. Similarly, further long-term studies of the predictors of obesity-related co-morbidities in adulthood are warranted; at present it is unclear how the target population of any monitoring programme should be defined. There is a need to consider these issues, and also the lack of data on the benefits and harms of monitoring, before moving away from the current population-based approach to obesity monitoring.

Recommendations for research

Monitoring for stature-related disorders

The primary consideration for future research on growth monitoring is the establishment of clinical

and cost-effectiveness. The clinical effectiveness of growth monitoring would be most reliably determined by a cluster randomised trial comparing growth monitoring strategies with no growth monitoring in the general population. Studies of diagnostic accuracy, alongside evidence of effective treatment strategies, could provide an alternative approach. In this context, careful consideration would need to be given to target conditions and intervention thresholds.

Diagnostic accuracy studies would require long-term follow-up of both short and normal children to determine sensitivity and specificity of growth monitoring. Qualitative research in the following areas would provide additional information pertinent to NSC criteria: attitudes of children, parents and health professionals to growth monitoring; system barriers to implementation; methods of management and quality assurance; training and staffing needs; optimisation of coverage; and the effects of participant information.

Monitoring for obesity

In the absence of evidence of effective interventions, the value of monitoring children in order to identify those who are overweight or obese will remain questionable. Research to identify weight reduction strategies that are effective in children is therefore a priority. Of equal priority is research on the effectiveness of primary prevention as an alternative or complementary strategy. Long-term epidemiological studies to establish which children are at most risk of adverse outcomes of obesity in adulthood is also a high priority; these studies define the target population for any monitoring programme aiming to identify and treat children. Before implementation of any such monitoring programme, funding for UK research into the benefits and harms of monitoring for and treating obesity, including long-term outcomes, would be a priority. Should effective treatments for obesity be identified, the effectiveness of monitoring for obesity would be most reliably determined by a cluster randomised trial comparing monitoring strategies with no monitoring and with alternative preventative strategies.

Publication

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NIHR Health Technology Assessment Programme

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