UK National Screening Committee

Screening for Type 2 Diabetes in adults

08 November 2019

Aim

1. To ask the UK National Screening Committee (UK NSC) to make a recommendation, based on the evidence presented in this document, whether or not screening for type 2 diabetes in adults meets the UK NSC criteria for a systematic population screening programme.

Current recommendation

2. The UK NSC currently does not recommend systematic population screening for type 2 diabetes in adults. The Committee based this recommendation on the evidence provided by the 2013 review carried out by the University of Warwick with funding from the Health Technology Assessment (HTA).

Evidence Summary

3. The 2019 evidence summary was undertaken by the University of Warwick, in accordance with the triennial review process: https://www.gov.uk/government/publications/uk-nsc-evidence-review-process/uk-nsc-evidence-review-process

4. The purpose of the 2019 evidence summary is to examine the proportion of people who have non-diabetic hyperglycaemia (NDH) who go on to develop type 2 diabetes mellitus (T2DM), the accuracy of screening tests for predicting future vascular disease, whether lifestyle interventions are effective for treating people who have non-diabetic hyperglycaemia, and whether screening for type 2 diabetes is beneficial.

5. The conclusion of the 2019 evidence summary is that the current recommendation, that whole population screening for type 2 diabetes in adults should not be introduced in the UK, should be retained. This is for the following reasons:

    - There is evidence of an association between non-diabetic hyperglycaemia and future T2DM. However, this is against a background of evidence uncertainties. Namely, not all people with non-diabetic hyperglycaemia will go on to develop T2DM, and many people with non-diabetic hyperglycaemia will regress to normoglycaemia, and so

might be at risk of overdiagnosis. **Criterion 1. Natural history of NDH (association with T2DM only): met; Frequency, severity, epidemiology, incidence, prevalence: not considered**

- There is some evidence that fasting plasma glucose (FPG), 2-hour postload plasma glucose (2-hour PG) and haemoglobin A1c (HbA1c) levels are associated with all-cause mortality and micro- and macrovascular complications of diabetes such as retinopathy and nephropathy. There is no consistent evidence that any one glycaemic marker (FPG, 2-hour PG, HbA1c) is better at predicting these outcomes. There was considerable variability between the included studies in terms of sample characteristics and blood glucose thresholds examined. All the studies were at high risk of bias, and the majority (12 out of 17) had applicability concerns that limit their generalisability to the UK screening setting. No studies were found that examined the predictive value of the 50g glucose challenge test (50g GCT) compared to FPG, 2-hour PG, or HbA1c. **Criterion 4. Comparative validity of tests: Not met (no clear evidence of superior test accuracy of one test over others); Overall validity: not considered; Simplicity, safety, precision: not considered**

- Overall, the body of evidence from this review and a recent Cochrane systematic review suggest a benefit of diet plus exercise on reducing the risk of T2DM amongst individuals who have NDH. However, the review did not examine whether pre-symptomatic detection and treatment of T2DM is beneficial compared to later treatment initiation following symptomatic detection, or if diet and exercise interventions are effective at reducing or preventing T2DM-related complications such as premature mortality, cardiovascular disease, and retinopathy. **Criterion 9. Effectiveness of lifestyle interventions to reduce progression from NDH to T2DM: Met; Effectiveness of lifestyle interventions for T2DM and to improve health outcomes such as cardiovascular events: not considered; Benefit of earlier intervention in pre-symptomatic phase: not considered; Evidence relating to the wider benefits of screening: not considered**

- Overall, the body of evidence from this review (a follow-up study to the ADDITION-Cambridge trial) and the recent Cochrane systematic review (which included the Ely trial and the ADDITION-Cambridge trial) supports the conclusion of the prior UK NSC review that there is currently a lack of evidence of a benefit of systematic population

screening for T2DM. There was no significant difference in risk of mortality between the screening and no screening groups in either the Ely and the ADDITION-Cambridge trial. In addition, the follow up study to the ADDITION-Cambridge trial showed no significant differences between screened and unscreened groups in self-reported cardiovascular events, hypertension, physical health, mental health, or quality of life. **Criterion 11: not met**

Consultation

6. A three-month consultation was hosted on the UK NSC website. Direct emails were sent to 11 stakeholders. **Annex A**

7. Comments were received from the following stakeholders:

    i. Royal College of Physicians of Edinburgh

8. The public consultation closed on 20 September 2019. One response was received, and it is presented below in **Annex B**.

9. The stakeholder noted that the review was comprehensive, that the findings were clearly presented, and the conclusions were appropriate and sensible.

10. The stakeholder also made the following observations:

    - Despite the NHS Prevention Programme's roll out, there is a risk in the future that without a formal screening programme in place, access to this programme via GPs and NHS Health Check providers, as well as uptake of opportunistic tests in GP practices may vary substantially depending on the geographical area.

    - Given that the Diabetes Remission Clinical Trial (DiRECT) published in May 2019 has shown that primary care-led weight management programmes can cause remission of diabetes, a screening programme could assist with early detection and prompt referral to such management programmes.

    - In relation to the benefits of screening for type 2 diabetes, a key limitation is that most studies are not conducted for a sufficiently long period of time to enable to see a beneficial effect.

Recommendation

11. The Committee is asked to approve the following recommendation:

A population screening programme for type 2 diabetes in adults is not recommended in the UK

Criteria (only include criteria included in the review)	Met/Not Met
Section 1 - Criteria for appraising the viability, effectiveness and appropriateness of a screening programme	
The Condition	
1. The condition should be an important health problem as judged by its frequency and/or severity. The epidemiology, incidence, prevalence and natural history of the condition should be understood, including development from latent to declared disease and/or there should be robust evidence about the association between the risk or disease marker and serious or treatable disease	**Natural history of NDH (association with T2DM only): met; Frequency, severity, epidemiology, incidence, prevalence: not considered**
The Test	
4. There should be a simple, safe, precise and validated screening test.	**Comparative validity of tests: Not met (no clear evidence of superior test accuracy of one test over others); Overall validity: not considered; Simplicity, safety, precision: not considered**
The Intervention	
9. There should be an effective intervention for patients identified through screening, with evidence that intervention at a pre-symptomatic phase leads to better outcomes for the screened individual compared with usual care. Evidence relating to wider benefits of screening, for example those relating to family members, should be taken into account where available. However, where there is no prospect of benefit for the individual screened then the screening programme should not be further considered.	**Effectiveness of lifestyle interventions to reduce progression from NDH to T2DM: Met; Effectiveness of lifestyle interventions to improve health outcomes such as cardiovascular events: not considered; Effectiveness of lifestyle interventions for T2DM: not considered; Benefit of earlier intervention in pre-symptomatic phase: not considered; Evidence relating to the wider benefits of screening: not considered**
The Screening Programme	
11. There should be evidence from high quality randomised controlled trials that the screening programme is effective in reducing mortality or morbidity. Where screening is aimed solely at providing information to allow the person being screened to make an "informed choice" (such as Down's syndrome or cystic fibrosis carrier screening), there must be evidence from high quality trials that the test accurately measures risk. The information that is provided about the test	**Not Met**

	and its outcome must be of value and readily understood by the individual being screened.	

UK National Screening Committee

List of organisations and individuals contacted

Annex A

1. British Society for Immunology
2. Diabetes UK
3. Faculty of Public Health
4. GlaxoSmithKline
5. Greg Fall
6. PHE adult screening programmes
7. Royal College of General Practitioners
8. Royal College of Nursing
9. Royal College of Physicians
10. Royal College of Physicians and Surgeons of Glasgow
11. Royal College of Physicians of Edinburgh

Annex B

Screening for type 2 diabetes in adults

Consultation comments

1. Royal College of Physicians of Edinburgh

Name:	Dr Sue Pound	**Email address:**	xxxx xxxx
Organisation (if appropriate):	Royal College of Physicians of Edinburgh		
Role:	Vice President		

Do you consent to your name being published on the UK NSC website alongside your response?

Yes

Section and / or page number	Text or issue to which comments relate	Comment *Please use a new row for each comment and add extra rows as required.*
General	General	The College generally considers this to be a robust and useful document. The document is lengthy and detailed, with much of the evidence considered coming from Cochrane systematic reviews. It is noted that a variable proportion of people with non-diabetic hyperglycaemia do progress to T2DM over time, but also that a considerable number regress to normality. It is additionally noted that lifestyle intervention can reduce the risk

		of progressing to T2DM, but that there was a lack of evidence regarding whether this had a significant beneficial effect on 'hard' outcome measures, such as cardiovascular morbidity and mortality. It is concluded that there is not sufficient evidence currently to recommend a change to existing advice on screening for T2DM. This seems have been a comprehensive review, using standard review methodology. The data presented are clear and the conclusions seem appropriate and sensible.
Criteria 9	Effectiveness of lifestyle intervention	The NHS has already commissioned 'NHS Diabetes Prevention Programme' https://www.england.nhs.uk/wp-content/uploads/2016/08/dpp-faq.pdf across England. General Practitioners and NHS Health Check providers are expected to refer patients to this programme. There is a risk that without a screening programme there will be variable access to this programme depending on location.
Criteria 9	Effectiveness of lifestyle intervention	The Diabetes Remission Clinical Trial (DiRECT) has shown that primary care-led weight-management programme can cause remission of diabetes. https://www.thelancet.com/journals/landia/article/PIIS2213-8587(19)30068-3/fulltext. Therefore it is essential to diagnose diabetes early and a screening programme would be likely to assist this early detection.
Criteria 4	Comparative validity of HbA1c, FPG and OGTT	Following publication of WHO guideline https://www.diabetes.org.uk/resources-s3/2017-09/hba1c_diagnosis.1111.pdf, which was accepted by Diabetes UK and widely practiced, most practitioners use

		HbA1c for screening of diabetes. Patients who visit their General Practitioner may have opportunistic HbA1c performed. Without a formal screening programme there may be variable uptake depending on post code.
Criteria 11	Benefit of screening of type 2 DM	Type 2 Diabetes is chronic disease and the complications are often only seen after many years. Even in the UK Prospective Diabetes Study (UKPDS) Group https://www.dtu.ox.ac.uk/Manuscripts/DTU230_Abstract.pdf cardiovascular benefit was not seen after 10 years, however there was some legacy effect. The benefit of screening would therefore likely only be seen after many years. Most studies are not conducted for long enough duration to see the beneficial effect.