Impaired glucose tolerance: qualitative and quantitative study of general practitioners' knowledge and perceptions

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Abstract

Objective To investigate general practitioners' knowledge of and attitudes to impaired glucose tolerance.

Design Mixed methodology qualitative and quantitative study with semistructured interviews, focus groups, and questionnaires.

Setting 34 general practitioners in five primary care groups in the north east of England.

Results All the general practitioners had knowledge of impaired glucose tolerance as a clinical entity, but they had little awareness of the clinical significance of impaired glucose tolerance and were uncertain about managing and following up these patients. Attitudes to screening were mixed and were associated with reservations about increased workload, concern about lack of resources, and pessimism about the effectiveness of lifestyle interventions. Some general practitioners felt strongly that screening patients for impaired glucose tolerance and subsequent lifestyle intervention medicalised an essentially social problem and that a health educational approach, involving schools and the media, should be adopted instead. A minority expressed a positive attitude towards a pharmacological approach.

Conclusion Awareness of impaired glucose tolerance needs to be raised, and guidelines for management are needed. General practitioners remain to be convinced that they have a role in attempting to reduce the incidence of type 2 diabetes by targeting interventions at patients with impaired glucose tolerance.

Introduction

Type 2 diabetes is a serious condition, with implications for the mortality, morbidity, and social functioning of patients. The prevalence of type 2 diabetes is increasing, and the number of patients in the United Kingdom is expected to rise from just over one million in 1997 to just under three million by 2010.[1] This will inevitably be reflected in rising costs. An estimated 7-8% of the total NHS budget is spent on patients with type 2 diabetes,[2] and the burden of caring for these patients is falling increasingly on primary care.[3 4]

Impaired glucose tolerance, typically characterised by hyperglycaemia and insulin resistance, is considered to be a stage in the development of type 2 diabetes. Up to half of all people with impaired glucose tolerance will progress to type 2 diabetes within 10 years of diagnosis.[5] In addition, people with impaired glucose tolerance are known to be at significantly increased risk of cardiovascular disease, which may present before the onset of diabetes.[6] Studies in the United Kingdom have reported the prevalence of impaired glucose tolerance in the 35-65 year age group to be around 17%.[7]

Increasing evidence indicates that intervention can favourably influence the clinical course of impaired glucose tolerance,[8–10] with some studies showing a 58% reduction in progression to diabetes.[11 12] However, information is lacking on British general practitioners' awareness of the clinical significance of impaired glucose tolerance and their current management of these patients. This study aimed to ascertain levels of awareness among general practitioners of the prevalence and clinical significance of impaired glucose tolerance and to explore their attitudes to its detection and management.

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Methods

Participants and setting

Focus groups

We used stratified random sampling (to give a representative male:female ratio from each primary care group) to recruit participants for the focus groups. We chose general practitioners from lists supplied by Derwentside, Sunderland West, South Tyneside, and Gateshead West and Central Primary Care Groups. We initially contacted potential participants by telephone and then invited them by letter to take part. We contacted 56 general practitioners, of whom 28 agreed to participate; two of these failed to attend. The remaining 26 general practitioners (18 men, eight women) participated in four focus groups (three groups of seven participants and one group of five participants). The mean age of participants was 44 (range 30-58) years; all were principals, with a mean of 11 (1-27) years' experience in general practice. The 30 general practitioners who either declined or failed to attend were similar in terms of sex and practice characteristics. The table shows the characteristics of individual participants.

Participants received an honorarium of £50.00. We held two focus groups in district general hospital postgraduate centres, one in a general practitioner surgery,

and one in the Centre for Health Studies, Durham University. The average duration of focus groups was 75 minutes.

Semistructured interviews

We chose the eight participants (six men, two women) in the semistructured interviews purposively[13] from a list of all general practitioners in one health authority. All were principals, with a mean age of 41 (31-46) years and an average of 12 (4-24) years' experience in general practice. Participants were chosen to reflect diversity in terms of age, sex, practice characteristics (list size, geographical location), and involvement in diabetes care (little involvement, lead general practitioner, clinical assistant in diabetes, primary care group adviser on diabetes) (table). All general practitioners invited agreed to take part. We conducted the interviews at participants' surgeries, and interviews had an average duration of 35 minutes. Participants received an honorarium of £25.00.

Collection and analysis of data

The lead investigator (GW) carried out all the focus groups and interviews, which were audiotaped for later transcription. Before each focus group, participants completed a questionnaire designed to evaluate their knowledge of the clinical significance and prevalence of impaired glucose tolerance. Their responses were then explored in the focus group discussion. The lead investigator then gave a short presentation, based on a review of the literature, on the anticipated rise in prevalence of type 2 diabetes, together with the clinical significance, prevalence, and management of impaired glucose tolerance.[1 2 5–11] Further focus group discussion centred around participants' attitudes to impaired glucose tolerance in the light of what, for most of them, was new knowledge.

We took a similar approach with the semistructured interviews, administering the questionnaire verbally and following this with open ended questions concerning knowledge of the clinical significance and prevalence of impaired glucose tolerance. We then gave a short presentation, as above, and used subsequent open ended questions to explore attitudes to and perceptions of the detection and management of impaired glucose tolerance.

We used a "pragmatic variant" grounded theory approach to analyse the data by generating categories and themes.[14 15] GW and APSH coded the data independently to increase the reliability of the study. We adopted an iterative approach to data analysis, with analysis beginning after the first focus groups and interviews, to allow emerging themes to be explored in subsequent interviews. The coders agreed that no new themes were emerging after four focus groups and eight semistructured interviews, and saturation was achieved.[15]

Characteristics of participants in focus groups (coded FG*nx*) and semistructured interviews (coded INT*n*)

Code	Age (years)	Sex	Employment status	Years in practice	Size of practice list	No of partners	Practice area	Role in diabetes
FG1a	58	Male	Full time	25	1 950	1	Suburban	Lead general practitioner
FG1b	41	Female	Full time	15	12 300	6	Semirural	Little involvement
FG1c	37	Male	Full time	5	20 000	9	Urban	Little involvement
FG4d	48	Female	Full time	5	3 100	2	Semirural	Little involvement
FG1e	50	Male	Full time	14	4 200	2	Suburban	Equal role with others
FG1f	44	Male	Full time	13	3 750	2	Semirural	Equal role with others
FG1g	52	Male	Full time	27	2 300	1	Rural	Lead general practitioner
FG2a	37	Male	Full time	4	12 200	5	Suburban	Primary care group adviser
FG2b	50	Female	Part time	11	8 700	6	Suburban	District diabetes advisory group
FG2c	44	Male	Full time	2	4 500	2	Urban	Lead general practitioner
FG2d	36	Male	Part time	4	8 000	4	Semirural	Little involvement
FG2e	55	Male	Full time	25	6 100	3	Urban	Lead general practitioner
FG3a	40	Male	Full time	12	5 000	3	Urban	Equal role with others
FG3b	47	Male	Full time	18	3 000	1	Urban	Lead general practitioner
FG3c	37	Male	Full time	7	10 000	4	Urban	Lead general practitioner
FG3d	53	Male	Full time	14	8 500	3	Urban	Little involvement
FG3e	36	Female	Part time	1	6 500	4	Suburban	Little involvement
FG3f	42	Female	Full time	11	11 500	7	Suburban	Lead general practitioner
FG4g	44	Male	Full time	20	5 000	3	Urban	Little involvement
FG4a	34	Female	Part time	3	11 000	7	Urban	Little involvement
FG4b	45	Female	Full time	16	9 800	6	Urban	Little involvement
FG4c	30	Female	Full time	1	7 100	4	Suburban	Little involvement
FG4d	40	Male	Full time	2	2 700	1	Suburban	Lead general practitioner
FG4e	54	Male	Full time	20	3 400	1	Suburban	Lead general practitioner
FG4f	37	Male	Full time	7	8 400	4	Semirural	Lead general practitioner
FG4g	42	Male	Full time	14	2 000	1	Semirural	Lead general practitioner
INT1	31	Male	Full time	4	8 500	5	Suburban	Little involvement
INT2	51	Male	Full time	24	15 000	6	Urban	Lead general practitioner
INT3	46	Female	Part time	14	15 000	8	Suburban	Clinical assistant
INT4	36	Male	Full time	6	2 150	1	Semirural	Lead general practitioner
INT5	46	Male	Full time	15	23 000	12	Semirural	Equal role with others
INT6	42	Male	Full time	15	20 000	9	Suburban	Lead general practitioner
INT7	42	Male	Full time	13	9 800	4	Semirural	Primary care group adviser
INT8	34	Female	Part time	6	7 200	5	Rural	Little involvement

Validation

To increase confidence in the validity of the findings, we sent all 34 participants a report summarising the outcomes of the study. Twenty eight (82%) replied stating that they "strongly agreed" (10 respondents) or "agreed" (18) that the report was a true representation of their opinions.

Results

Questionnaires—All participants were aware of impaired glucose tolerance as a clinical entity. However, 16 (47%) participants were unaware of the risk of impaired glucose tolerance progressing to type 2 diabetes, and 21 (62%) were unaware of the increased risk of cardiovascular disease. In addition, 17 (50%) participants had no idea how many patients with impaired glucose tolerance might be known to their practice, and 13 (38%) estimated prevalence at less than 1% (figure). *Focus groups and interviews*—Three main themes emerged from data collected before participants received a presentation detailing the anticipated rise in prevalence of type 2 diabetes, together with the clinical significance, prevalence, and management of impaired glucose tolerance (box 1). Eight main themes emerged after the presentation (box 2).

Box 1: Main themes from data collected before participants received evidence based presentation on impaired glucose tolerance

Low awareness of the prevalence and clinical significance of impaired glucose tolerance

"I would have no idea … I mean, as I say I think … I doubt if we have very many that have been formally identified" (INT1)

"Perhaps 2%?" (INT8)

"… probably a lot of our colleagues are pretty ignorant about the implications of impaired glucose tolerance" (FG3f)

Uncertainty about managing patients with impaired glucose tolerance

"There's the book of guidelines; is there one [a guideline for management of patients with impaired glucose tolerance] in there?" (INT5)

"I must say, we don't repeat their glucose tolerance test … they might get a sugar level done" (FG2c)

"I don't honestly have a … a … plan for what we would do" (INT1)

Support for a guideline for managing impaired glucose tolerance

"Of course, it would be excellent if we had a guideline to follow" (FG1g)

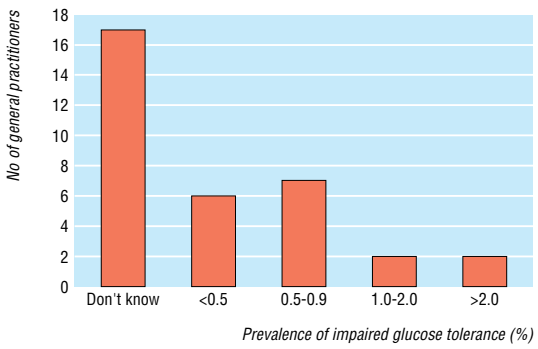
"Yeah, I think the more that you have guidelines the more that actually these sort of things can be passed over to the nurses and to people who are actually probably much better than we are at monitoring these things" (FG1e)

"There should be guidelines for us to have … and a greater ability to follow so that those patients who come up that we think we can succeed with … we can have a proper plan of action" (FG4f)

Discussion

The aim of this study was to investigate general practitioners' knowledge of the prevalence and clinical significance of impaired glucose tolerance and their attitudes to its detection and management. The results indicate that awareness of the existence of impaired glucose tolerance was good but that awareness of the prevalence and clinical significance of impaired glucose tolerance was poor. In addition, general practitioners seem to be uncertain about how best to manage and follow up these patients. This has implications for the training and education of general practitioners, and not least for patient care in a field that is likely to expand exponentially in the next few years.

The study also indicates that only a small proportion of patients with impaired glucose tolerance are currently known to practices and that general practitioners are reluctant to pursue more aggressive case finding and management, even after being presented with a critical appraisal of the literature. Several factors seem to contribute to this unwillingness to screen and intervene in this condition. General practitioners were afraid of being overwhelmed by the workload generated, admitting to reluctance to divert finite resources away from other clinical areas, and were pessimistic about the effectiveness of lifestyle intervention. Furthermore, some felt strongly that screening patients for impaired glucose tolerance and subsequent lifestyle intervention would medicalise an essentially social problem and that a health educational approach, involving schools and the media, should be adopted instead. Other studies have shown that general practitioners lack confidence in their ability to change lifestyle behaviour and suggested that the solution would be to increase training and support.[16 17] Pill et al have shown how difficult it is for primary healthcare professionals to change patients' behaviour in the context of type 2 diabetes.[18] Our findings are in broad agreement with those of Lawlor et al, who found that general practitioners were in favour of measures to tackle social and environmental determinants of ill health.[19]



General practitioners' estimation of the number of patients known to have impaired glucose tolerance in their practice

Conversely, some of the general practitioners in this study expressed a positive attitude towards pharmacological intervention in patients with impaired glucose tolerance, even though the effectiveness of this has yet to be shown in large scale clinical trials. This may be because of the perception that pharmacological intervention is ultimately likely to be more effective than lifestyle intervention. However, it could also be argued that the act of prescribing drugs for these patients essentially defines impaired glucose tol-

Box 2: Main themes from data collected after participants received evidence based presentation on impaired glucose tolerance

Fear of being overwhelmed by the workload involved in screening and managing patients with impaired glucose tolerance

"I think we all probably fight shy of diagnosing too many people with impaired glucose tolerance, I mean, I'm sure we all do it. I mean, I occasionally get people who've had a borderline high sugar and it gets passed to the nurse for dietary intervention … they don't all have a glucose tolerance test; the reason for that is it involves a whole lot of workload" (FG3c)

["So there's a resistance from the profession because of the workload implications, is that what you're saying?"] "Yes, basically" (FG2d)

"Who wants to find someone you've got to treat and measure their blood every so often?" (FG3d)

Concern that widespread screening and management of patients with impaired glucose tolerance would be impossible without extra resources

"The practices simply can't be taking all the load. I think there are huge resource implications for the practices involved. Certainly there is a huge disincentive at the moment for me to find any more patients because I can't afford to treat them" (FG1a)

"But our role shouldn't be to intervene unless we've got the resources to do it … we've done that before, and we just pay lip service to it" (FG4b)

"It would be very difficult with the present staffing … I think it would be very difficult. We would have to have additional resources to do it" (INT2)

Concern at diverting finite resources from other clinical areas

"… why should we be doing that when we haven't even … when we're not even treating the ones that have got it [type 2 diabetes] properly yet?" (INT6)

"Fine, yes, in theory [we could screen for impaired glucose tolerance], but we haven't only even got diabetes to look after … but you've got so many things to look after and outside issues as well, so where does it stop?" (FG1e)

" [I wonder] where the money's going to come from to perhaps employ new staff and that sort of thing. There are barriers on a health authority scale—it's going to be, it might mean a shift of resource towards one thing rather than something else" (INT8)

Pessimism regarding the effectiveness of lifestyle intervention

"… we have diabetics who … who just totally ignore the advice you give them, and I think going further back than that and giving them advice when they haven't got diabetes as such is going to be very difficult" (INT4)

"Around here, I just wonder how effective lifestyle advice is going to be" (INT6)

"… trying to persuade them [patients with type 2 diabetes] to make any changes at all in their behaviour just makes my heart plummet … the initiative [giving lifestyle advice to patients with impaired glucose tolerance] coming from us, I think, is doomed to failure (FG3e)

Positive attitudes towards pharmacological intervention in patients with impaired glucose tolerance

"Well, even that [lifestyle intervention] is a tall order for a lot of them. I just feel as though, if you're going to do this, you've really got to put them on metformin. I mean that's what's happened with our [CHD patients] … I mean we started off with exercise, diet and that kind of thing, stopping smoking, and now, I mean we've substituted that with statins, atenolol, and lisinopril … I think it shouldn't be too expensive; metformin presumably is a comparatively cheap drug" (FG2c)

"More than happy, I mean we … we're starting to come on board with this as a group … a high risk group that … um … sort of an aggressive treatment is the only way to possibly, to make any difference. So yes, I would be happy to prescribe" (INT7)

"I think if I had impaired glucose tolerance I would take the metformin to delay the diabetes" (FG4g)

Uncertainty regarding the role of general practitioners in detecting and treating impaired glucose tolerance

"I think it's our job to educate people and give them the information and let them make the choice. I think the people who are motivated, who are in control of their own lives, will take that advice and act on it and then the rest of the people will just carry on until something bad happens" (FG2d)

"I think we've got a role in that [detecting and lifestyle intervention for impaired glucose tolerance] to some degree, but I don't think it's educating everybody in town and sort of leading their lives for them" (FG1f)

"But that's not my job, you know; I'm a GP and I'm actually there probably not to do a lot of prevention but to actually do a little bit of tinkering with the people already ill" (FG4f)

Concern that screening and treating impaired glucose tolerance medicalises an essentially social problem

"It's a society cop out; we're always trying to medicalise things, and it's the same as, you know, I think, the current vogue for medicalising teenage pregnancy … and under age smoking and everything else" (INT5)

"… these [preventing chronic disease] are all kind of social things, and throughout history what we have to accept, as doctors, is that we have a very minimal impact on the health of society" (FG4f)

"I think it's on a bigger scale than us having to prevent it [type 2 diabetes] right at the end of the line. It's like us preventing suicides when there's unemployment and stress" (FG3e)

Positive attitudes towards a health educational approach

"I think improvements could be made with people with glucose tolerance if they are educated about glucose intolerance at school; if they could have fruit at school instead of hamburgers and chips they probably … and therefore the change has to start from school up and the responsibility of educating I think should be put on to schools" (FG1a)

"If all schools had free fruit and free healthy living, free exercise … then in 20-30 years' time I suspect the impact of that would be enormous" (FG4d)

"I think health promotion must have a huge responsibility—they have a huge budget … I mean, hundreds of thousands of pounds go into health promotion. Why can't they organise themselves and, if needs be, set up opportunistic screening at supermarkets … to prevent people coming out with the wrong things in their baskets" (FG1g)

erance as a medical problem, and general practitioners have been shown to be more comfortable managing illness than preventing disease.[20]

The general practitioners who participated in this study broadly supported the provision of a guideline for the management of patients with impaired glucose tolerance in primary care, but we were unable to find any suitable published guideline. This has implications for guideline development. General practitioners have positive attitudes towards the use of guidelines,[21] although problems exist with regard to implementation.[22]

Methodological considerations

The rigour of this study was increased by triangulation,[23] both of methods and analysis, and by validation by respondents. However, few data were available on the 30 out of 64 general practitioners who either declined or failed to participate. Although sex and size of partnership were broadly similar, we had no way of knowing if the knowledge and attitudes of these general practitioners differed from those participating in the study. In addition, we cannot exclude the possibility that the personal and intellectual bias of the lead investigator (GW) may have shaped the data. This has been minimised by making the account as reflexive as possible and by reporting a wide range of different perspectives, a method described by Mays and Pope as "fair dealing."[23] Factors relating to the ethnic origin of patients did not emerge as a theme from our data. Two out of eight general practitioners interviewed were of Asian ethnic origin, and each focus group contained one or two such participants. The population prevalence of patients of Asian ethnic origin in the study area is low (0.3% for County Durham, 0.5% for Gateshead and South Tyneside, and 0.6% for Sunderland, compared with 3.3% for England and Wales[24]). This may limit the generalisability of our study to areas with large ethnic minority populations.

Conclusions

The recently published *Diabetes National Service Framework: Standards* document recommends that the NHS and partner organisations adopt both a "population" approach (tackling obesity and sedentary lifestyles) and a "targeted" approach (identifying and intervening in high risk groups, such as patients with impaired glucose tolerance) to reducing the incidence of type 2 diabetes.[25] The national service framework recognises that such interventions are also likely to have an impact on reducing cardiovascular disease. Similarly, early treatment of macrovascular risk factors may be more important than screening for and treating asymptomatic type 2 diabetes itself.[26] Although studies from other countries have shown encouraging results,[11 12] questions about the feasibility of primary prevention of type 2 diabetes in the United Kingdom remain unanswered. Our findings clearly show that general practitioners have major reservations about the appropriateness and effectiveness of giving lifestyle advice to patients in this context. Similarly, we have shown that general practitioners perceive the need for considerable extra resources if they are to be given the task of screening for impaired glucose tolerance and intervening in patients at high risk of progression to type 2 diabetes. This has important implications, both for the implementation of the diabetes national service framework and for primary care research.

What is already known on this topic

Impaired glucose tolerance is common and carries a 50% risk of progression to type 2 diabetes within 10 years of diagnosis and a doubling of the risk of developing cardiovascular disease

Lifestyle intervention can significantly reduce the progression to diabetes, although the evidence for reduction in cardiovascular disease is less compelling

What this study adds

Awareness of the clinical significance of impaired glucose tolerance among general practitioners is low

General practitioners are uncertain how best to manage and follow up patients with established impaired glucose tolerance

General practitioners are reluctant to screen patients for impaired glucose tolerance for a variety of reasons

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