

Routine glutamic acid decarboxylase autoantibody (GADA) testing: patients' perspective

H Davies, SB Mannan, S Brophy and R Williams

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Background. Latent autoimmune diabetes in adults (LADA) is a form of type 1 diabetes which in the UK is often diagnosed and treated as type 2 diabetes (T2D). People with LADA show slow progression to insulin dependence and can be distinguished from T2D by blood tests for glutamic acid decarboxylase autoantibodies (GADA).

Aims. This study explores the views and experiences of patients who are newly diagnosed with LADA, with particular reference to (i) routine GADA testing; (ii) whether this diagnosis has any influence on the self-management of their diabetes; and (iii) the information needs of patients newly diagnosed with LADA.

Methods. Ten consecutive patients newly diagnosed with LADA (GADA positive) were invited to participate in individual qualitative semi-structured interviews. Their views and experiences were analysed into codes and categories, using a constant comparative method.

Findings. Participants supported routine GADA testing in all patients with diabetes because the provision of a correct diagnosis has an empowering effect on patients, as it encourages the consideration of treatment options early on in the condition. Participants preferred to rely on future HbA_{1c} levels and their doctor's opinion to determine a change in treatment to insulin. Some participants had difficulty distinguishing between the different types of diabetes, including LADA. Others needed to ask questions about LADA in addition to written information.

Conclusions. Participants were supportive of routine GADA testing, would prefer not to start insulin immediately following a diagnosis of LADA and needed to discuss treatment options with health professionals who were knowledgeable on LADA.

Keywords. Latent autoimmune diabetes in adults, qualitative, patient views.

Introduction

Latent autoimmune diabetes in adults (LADA) is a type 1 diabetes (T1D)¹ which shows slow progression to insulin dependency. LADA is often treated as type 2 diabetes (T2D). This is because a person with LADA is not dependent on insulin, at diagnosis. However, such individuals are at risk of becoming insulin dependent.^{2,3} Most patients with LADA do require insulin within 6 years of diagnosis and early initiation of insulin may protect the beta cells.³

Studies have suggested that 10–13% of patients diagnosed with T2D may have LADA,⁴ but despite this frequency there are no universal recommendations for

antibody testing in adult onset diabetes⁵ and no testing is routinely available in the UK at present. The decision to test a person for autoantibodies is generally based on body weight alone.⁶ Certain studies have observed no differences between the body mass index of patients with LADA and T2D⁷ indicating that a significant proportion of patients with LADA would not be tested for antibodies and be treated as T2D.

A Cochrane review⁸ investigating the interventions for people with LADA concluded that sulphonylurea is not recommended for people with LADA, as progression to insulin dependence is faster than with other glucose lowering agents.³

Identifying patients with LADA is of public health interest for the correct classification of diabetes and

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Centre for Health Information, Research and Evaluation (CHIRAL), The School of Medicine, Swansea University, The Grove Building, Singleton Park, Swansea SA2 8PP, UK. Correspondence to H Davies, Centre for Health Information, Research and Evaluation (CHIRAL), The School of Medicine, Swansea University, The Grove Building, Singleton Park, Swansea SA2 8PP, UK; Email: h.davies@swansea.ac.uk

consequently diagnosis, treatment and the provision of appropriate patient information.

As part of a study examining the prevalence and characterization of LADA,⁹ we set out to explore the views of patients who are newly diagnosed with LADA including: routine glutamic acid decarboxylase autoantibody (GADA) testing, whether this diagnosis had any influence on the self-management of their diabetes and the information needs of patients with LADA. This study provides the first data, collected directly with patients who have been tested for GADA.

Methods

Sampling population

This is a consecutive sample. The first 10 patients who tested positive for GADA were invited for an interview, and all patients invited agreed to do so. GADA were measured in radio-binding assays in the Department of Clinical Science at North Bristol, University of Bristol, UK.¹⁰

Study participants

Patients ($n = 667$) diagnosed with apparent T2D in 30 general practices within the previous 24 months were tested for GADA. Of these, 28 patients were GADA positive (LADA). The researcher wrote to the patients GP to inform them of a positive GADA result and included two LADA information booklets (one for the GPs' reference and one for the patient when diagnosing them with LADA). Patients were asked by their GP whether they agreed to be contacted by the researcher. An interview was then scheduled by the researcher. Demographic data were also collected as part of the main study to help characterize people with LADA, including age, gender and ethnicity.

Design

This explorative study used qualitative semi-structured interviews which were conducted on a one to one basis. Open-ended questions were used to explore patients' experience of GADA testing and subsequent diagnosis of LADA. One researcher (HD) facilitated the interview process and another researcher (SBM) provided technical support (audio taped) and recorded non-verbal information, including body language.

Interviews were carried out between August 2005 and August 2006, at a setting of the patient's choice. Each interview lasted between 30 and 90 minutes and was transcribed by an independent person. Each participant received a LADA booklet prior to the interview, of which the LADA website is signposted <http://www.locallada.swan.ac.uk/>. Areas explored within the interviews are illustrated in Table 1.

TABLE 1 *Interview schedule*

Participants ID number:
Explore participants information needs in relation to LADA
1. Tell me what you know about your diabetes following the results of your blood test? (GADA)
2. What information have you received about your diabetes, following the results of your blood test? Prompts i.e. verbal/written/website
3. What do you think about the information given to you following the results of your blood tests?
4. Any other information that would have been helpful to you?
Explore views and experiences on having a positive GADA test
5. Would you have the blood tests again, retrospectively (looking backing)?
6. What do the results mean to you?
7. How do you feel about the results of your blood test?
8. Would you advise others to have this test if they have recently been diagnosed with diabetes?
Explore views on the treatment and management of their diabetes following a positive GAD result
9. Has the result of this test (GADA positive) changed how you will manage your diabetes? Prompts: i.e. continue with your current treatment plan for diabetes. (ii) change treatment and start insulin therapy?
10. What factors have influenced the above decision? Prompts i.e. GP, diabetes nurse, family or friends, internet or other sources of information.
Questions
11. Do you have any further questions regarding your experience of participating in the LADA study?

Analysis

This study used a constant comparative method to facilitate the analysis process.¹¹ The analysis took place in two stages: The first two interview transcripts were read by both researchers separately in order to enter the interviewees' frame of reference.¹² After the first two interviews, researchers met and agreed on the codes which were done. The codes were done independently, by hand, by the two researchers to assess the reliability of the coding. Following open coding, axial coding was used to identify categories with code words.¹³ At this stage, the researchers' initial thoughts were recorded to help explain the thinking that underpins the coding process.

Data collection and analysis ran concurrently for the remaining interviews. The same procedure of analysis was applied to each subsequent interview.

Ethical considerations

Participants in this study were told they have a T1D and not a T2D and are likely to be on insulin eventually. This may potentially be upsetting.

Findings

Study participants

The number of participants ($n = 10$) was determined by the point when no new themes emerged, and this was after the eighth interview. Two more interviews

were conducted to identify whether any new themes arose and data saturation had been reached.

Mean age of the participants was 56 years (range 22–73 years), 7 were female and all were White Caucasian. All patients were newly diagnosed with apparent T2D and had a GADA-positive test of >32 U/ml¹⁴ [mean 424 U (SD 333 U) range 57.7–969.2 U].

The findings presented here focus on the main categories that were highlighted from the analysis. Six categories were identified: (i) diabetes knowledge; (ii) emotional response; (iii) health professionals and information; (iv) time to insulin; (v) test or not to test; and (vi) seeking information.

Experience of a LADA diagnosis

Diabetes knowledge. Some participants ($n = 6$) in this study identified themselves as having T1D as opposed to T2D. Others ($n = 4$) were unable to distinguish between T1D and T2D and perceived diabetes as one condition. The following dialogue illustrates this misconception, ‘I didn’t know there were so many different types of diabetes to be honest ... I thought diabetes was diabetes’ (n1p2). Being diagnosed with LADA did affect the emotional responses of participants.

Emotional response. Many participants ($n = 7$) were anxious and confused regarding the future treatment of their diabetes following a LADA diagnosis. In particular, whether they would choose to start insulin or remain on their current regime. One participant said, ‘I am getting confused now. I thought when you were told that you had diabetes you were on insulin straightaway. Then I found you can go on tablets, and then you can go on insulin. And now I find you can go on insulin straight away and no tablets’ (n1p4/5).

Other participants felt surprised and shocked when told they had LADA, as illustrated in the following quote, ‘It was a bit of a surprise when my results (GADA) came back, somebody was saying that I was virtually a level 1 not a level 2, and without this test I wouldn’t have known, and I would have been treated as type 2’ (n4p4).

Observational notes were kept on each participant during the interview, and many participants showed signs of anxiety, i.e. fidgeting and restlessness and many participants needed reassurance (repeating questions) about the future treatment of their diabetes. The observations were clarified with each participant for accuracy, at the end of the interview.

The majority of participants (9 of 10) stated they were happy to have had the test, despite the emotional responses associated with being informed they now have a slowly progressive T1D, not a T2D. The following category explores how participants perceived health professionals’ roles and behaviour within the process of being diagnosed with LADA.

Health professionals and information. Six participants were given the LADA diagnosis by either their GP or nurse, and one participant received a letter from their GP. The remaining three participants were not given a specific LADA diagnosis by health professionals, rather general advice and information on diabetes care. One participant suggested that she had information overload regarding her LADA diagnosis and felt she was just coming to terms with being newly diagnosed with diabetes. However, another felt she was happy with the information received at diagnosis on treatment options from her GP. In general, participants felt they had received limited information from their primary health care team at the time of their LADA diagnosis. One participant said, ‘Looking back at it, well perhaps I should have been more informed about it’ (LADA) (n8p38). The following category discusses some of the decisions participants made about managing their diabetes following a LADA diagnosis.

Time to insulin. The majority of participants managed their diabetes with diet/oral hypoglycaemic agents ($n = 8$) and preferred this method of treatment because it can be taken orally, and most people in this study were ‘already taking other tablets’. Two participants were on insulin by the time of the interview and found the transition to insulin therapy, ‘a small price to pay for health’ and had more ‘flexibility with the diet’ since taking insulin (n7p8).

Most participants on diet/oral hypoglycaemic agents ($n = 7/8$), if given the choice would prefer to go on insulin later rather than sooner. The main reason for this included (i) reliance on what the doctor thought best, one participant implied, ‘If the doc says to me well I think you would be wise to do so then I wouldn’t hesitate, but I would prefer to go on tablets rather than to give myself injections’ (n5p14); (ii) future blood glucose control (Hb_{1c} levels), one participant commented, ‘I’d like to give it at least some time to see how it goes, and if the tablets keep controlling it then I’d like to do it that way’ (n2p6); and (iii) time in relation to own lifespan, another implied, ‘I am not going to worry about three or five years time because I will be seventy’ (n9p4).

Unanimously, participants felt that ‘time’ was a factor needed to enable them to adjust to the diagnosis of LADA and the often inevitability of using insulin for glycaemic control.

For the majority of participants, the decision to remain on diet and/or oral hypoglycaemic agents was also influenced by the perceived challenges to insulin therapy. This is illustrated in Table 2.

To test or not to test. The majority of participants (9 of 10) were glad upon reflection to have been tested for GADA and would support the test in primary care

for other newly diagnosed people with diabetes. One participant felt empowered and suggested that, 'If the sugars start to rise, I am going to have to see about this and get in touch with doctor and say look, what about this LADA business' (n10p53). Another participant thought the test was convenient, saying, 'You might as well do it (GADA test) because you are going to the hospital in any case, to do the normal tests' (n4p10). One participant who was symptomatic and unwell at the onset of his diabetes stated, 'If the test had been available, I would have probably been on insulin a lot earlier and that would have stabilised me ... it would have been a shock but I would have rather taken the test and known straight away ... and it would have removed the uncertainty and the doubt away' (n6p5/6).

All participants felt it important to have a correct diagnosis at the onset of their condition. One participant implied: 'Everybody should be able to have this ... I can't see why everybody isn't having this test. You know, if you are getting diagnosed with a type 2 and you are actually type 1, it is going to be bad for you in the long run ... they are not treating you right' (n7p6). Other participants had genetic concerns, and one participant said, 'My son is not very happy in case I pass it on to him, and it could have been passed on to me through my parents' (n10p6).

Seeking information. All participants received a LADA booklet prior to the interview, and it was described by people as, 'good', 'informative' and 'straight to the point ... it told you what you needed to know' (n7p4). However, all participants needed to be able to ask questions in addition to reading the LADA booklet. If written

information is given in conjunction with a verbal message, then its effectiveness can be increased and supported.¹⁵

The LADA website was signposted in the LADA booklet. Only one person accessed the website prior to the interview. Reasons given by others for not accessing the website included a lack of computer skills and no access to a computer. However, some implied they may access the website in the future, through family or friends. According to participants in this study, the best method of information giving appears to be written information and the opportunity to ask questions face to face.

Following each interview, people had the opportunity to ask questions about their condition and the future care of their diabetes, which fell into two distinct categories: (i) LADA/diabetes in general; and (ii) insulin (see Table 3).

Asking questions following the interview reinforces the importance of offering people newly diagnosed with LADA face-to-face contact in order to discuss LADA in general and the practicalities and challenges of insulin therapy.

Discussion

In this exploratory study, using qualitative semi-structured interviews, we have been able to highlight some important issues that need to be considered when testing people for GADA.

Communication between health professionals and participants in relation to treatment options for people with LADA seems limited. Based on the findings, the first challenge appears to be the provision of adequate information to patients when diagnosing LADA? However, the literature suggests that diagnosing a chronic illness is an emotional time for patients¹⁶ and patients report feelings of shock, despair and

TABLE 2 *Challenges to starting insulin*

Physical issues	The procedure of taking insulin, i.e. needles/injections The procedure of self-blood glucose monitoring The potential side effects of insulin, in particular hypoglycaemia Feeling well at present Age. People >64 years felt that 'time' was not on their side and the need for insulin may not ever be reached
Psychological issues	Perception of going on insulin as a 'problem' Insulin viewed as a 'failure' and associated with the complications of diabetes rather than a treatment Time associated with 'coming to terms with it' Anxiety at the thought of commencing insulin therapy
Social issues	Having to inform the Driver and Vehicle Licencing Agency and insurance companies of insulin therapy (potential loss of driving licence and higher premium costs with insurance companies) Social events, i.e. eating out and travelling abroad with insulin

TABLE 3 *The seeking of new information*

LADA and diabetes in general	Prevalence of LADA Causes of LADA Differences between T1D and T2D Diabetes care Future treatment and management of LADA Procedure of GADA testing and interpretation of the result Genetic issues LADA and diet advice Effects of LADA on the body Complications of LADA
Insulin	Procedure of insulin therapy Insulin regimes Insulin equipment, i.e. pens, needles and injection sites LADA and insulin Side effects of insulin Effects of insulin on the body

anxiety in various degrees.¹⁷ Also, people who are anxious may not absorb or retain all the verbal information they are given.¹⁸ Participants in this study felt confused and anxious and also reported feelings of shock when told they had LADA. Unfortunately, this situation is further exacerbated due to the limited amount of clinical evidence available to guide health professionals as to the best treatments for patients with LADA. Therefore, it is not surprising that participants had little knowledge about LADA and felt they had received limited information on LADA from health professionals and continued to seek further information and reassurance about their diabetes.

The ease and convenience of taking oral medication, age of a person, doctor's opinion, time to adjust to having LADA and the challenges of insulin therapy appeared to influence participants to not want to start insulin immediately following a diagnosis of LADA. The challenges of initiating insulin therapy are not unique to this study.¹⁹ However, a recent study²⁰ suggests that bringing in GADA testing will mean positive patients will be put on insulin sooner than they currently would be without testing. Therefore, the act of GADA testing will influence when a patient starts insulin.

Despite feelings of anxiety and the need for reassurance following a diagnosis of LADA, support for GADA testing is strong. Participants want it to be made routinely available for all patients newly diagnosed with diabetes because it is convenient and can be carried out with other routine blood tests for diabetes; GADA testing appears to empower patients by reassuring them and by providing a correct diagnosis. People who know they have LADA are more informed and willing to participate in shared decision making in relation to treatment options, early on in their condition.

Study limitations

In this study, people who were GADA negative were not interviewed for their opinion on routine GADA testing, which would have been useful to explore.

Conclusions

To conclude (i) participants were supportive of routine GADA testing in primary care and see it as an integral part of their diabetes care but (ii) were reluctant to change their medication regime immediately following a diagnosis of LADA and (iii) need appropriate information at diagnosis (verbal and written) and have the opportunity to be able to ask questions about LADA.

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Conflicts of interest: None.

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