Exploratory Evaluation of Variation in Statin take up amongst high risk patients in Nottingham City

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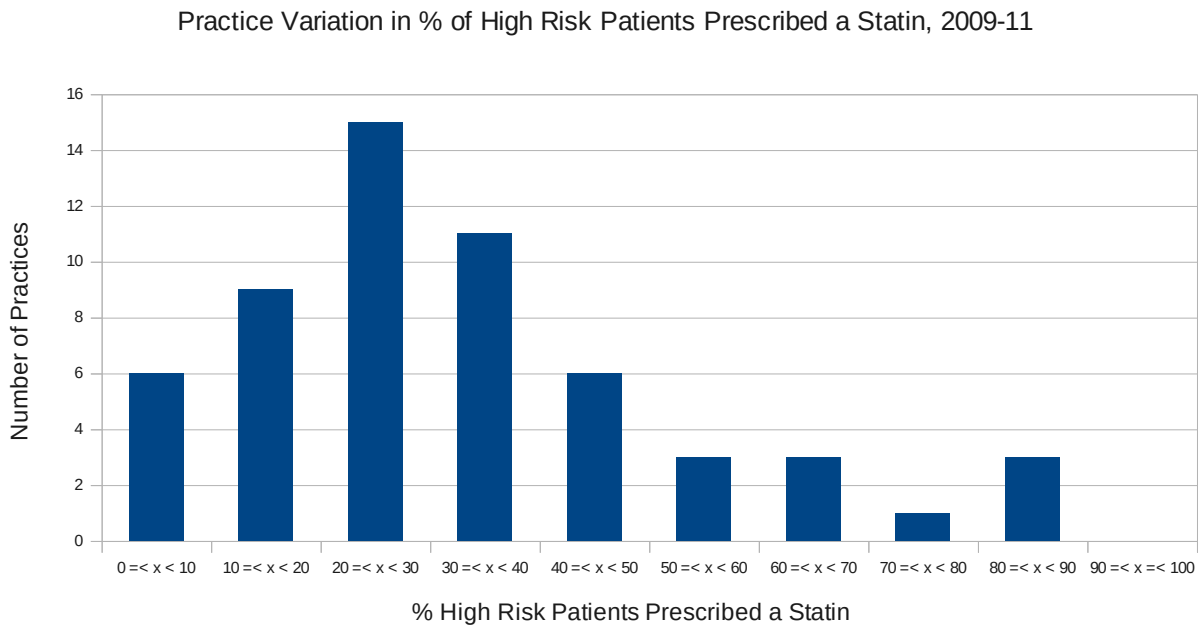
Introduction

The NHS Health Checks programme is a national policy for England delivered in primary care, that aims to invite all 40-74 year olds, without a prior diagnosis of cardiovascular disease (CVD), diabetes, chronic kidney disease or hypertension, for a risk assessment and treatment (if necessary) once every five years (DH Vascular Programme 2008; NHS Health Check Programme 2009)□. The Health Checks programme is designed, through this risk assessment and preventive treatment, to reduce the incidence of CVD as well as help to tackle health inequalities and the rise in obesity (DH Vascular Programme 2008)□. For primary prevention the programme, following NICE guidance, recommends that patients found to be at high CVD risk (those estimated to have a 10-year risk of 20% or greater, as measured by QRisk2) should be offered interventions including statin medication and lifestyle changes, to reduce modifiable risk factors (National Institute for Health and Clinical Excellence 2010)□.

Practices within Nottingham City CCG conduct targeted CVD screening, and are rolling out the Health Checks to all 40-74 year olds. From 2009-11, 10001 eligible patients were screened. Of these, 4260 patients have been found to be high risk, but only 2541 are known to have been started on statin medication (see Figure 1.1) [REF public health audit within Nottingham City CCG]. The reason for this disparity is not understood, and there is known to be wide variation, within and between practices, in statin uptake in high risk patients [REF - PCT Board Paper 198/11].

This small (qualitative) pilot study aims to explore the variation in statin uptake among GP practices within NHS Nottingham City CCG by focusing on the reasons why those who have been identified as high risk (and thus are suitable to take a statin) accept or decline statin medication.

Figure 1.1



Background

Previous studies of statin prescribing have often focused on the health inequalities associated with variation in statin uptake in the general (as opposed to a high risk) population. Studies have explored the contribution of variables such as social deprivation and CVD risk factors (age, gender, ethnicity, etc) to levels of uptake. (Thomsen et al. 2005; Ward et al. 2007; Ashworth et al. 2007; Packham et al. 1999; Packham et al. 2000)□; indeed two such studies were conducted in Nottingham, between 1996 and 1998, showing increased statin use overall and lower correlation between deprivation scores and statin use over time (Packham et al. 1999; Packham et al. 2000)□. In general results are idiosyncratic and regression models typically explain only between 15-35% of the variation in uptake. Furthermore, studies at the practice or population level should be interpreted cautiously, since it may be difficult to discriminate variation in uptake due to social differences in health, the quality of healthcare or the use of healthcare. Clearly however, health inequalities in the general population threaten the success of policies such as the Health Check, if, to take one example, those with a higher disease burden are systematically less likely to attend for the Health Check.

More relevantly, the Health Check programme itself has been the subject of study, with authors modelling the prevalence of CVD risk factors in the target population (Dalton, Soljak, et al. 2011), and investigating variation in risk factor recording (Artac et al. 2012)□ as well as investigating variation between (what were formerly) Primary Care Trusts (PCTs) in the ways that the programme is implemented (C. E. M. Graley et al. 2011)□. Notably, (Dalton, Bottle, et al. 2011)□ studied the uptake of the Heath Checks programme within Ealing PCT between 2008-09, finding a lower than expected uptake. Perhaps most relevantly (Dalton, Bottle, et al. 2011)□ found low overall statin prescribing among high risk patients (45%, actually slightly higher than the Nottingham data), which they speculated may be due to: a proportion of high risk patients with no history of vascular management declining statin medication; patient and practitioner beliefs about the risks and benefits of statin medication as well as beliefs about the idea of treating risk; and additionally, due to a measurement bias introduced by long delays between attending for Health Check and being prescribed a statin (2011: 427).

Below the population level, studies have examined the sociological factors which affect statin prescription. Importantly, (Mohammed et al. 2012)□, in a study of primary prevention in the West Midlands in the UK, found that high risk patients are often not prescribed a statin despite their eligibility; although more risk factors were found to increase the likelihood of statin prescription. Similar studies in the UK have also examined how patient values are integrated into treatment decisions concerning CVD risk (Montgomery et al. 2001; Bryan et al. 2006; Lewis et al. 2003). The idea that patient choice must involve genuine collaboration between doctor and patient in order to integrate values and preferences with evidence is underscored by a number of authors. For example, (Bryan et al. 2006)□ found that patient preferences are “largely over-ridden in the clinical consultation”, and (Lewis et al. 2003)□ found much diversity in the ways that patient's assess the level of benefit that is considered worthwhile when balanced against the length of treatment (e.g. 5 or 10 years), potential side effects, the inconvenience pill taking and the availability of other ways of managing risk through lifestyle changes; noting the challenges this poses when set against guideline recommendations.

Methods

Study Design and Sample

Study Design:

This was a small-scale qualitative study exploring reasons for variation in take up of statin prescriptions among patients identified as being at high risk. From 6 practices within Nottingham City CCG, short (10 minute) telephone interviews were conducted with a total of 28 patients, and longer (30 minutes) face-to-face interviews were conducted with 4 GPs.

Practice Sample:

Practice level data was obtained from Nottingham City CCG. Statin uptake (the percentage of high risk patients identified by a practice, who subsequently took up a prescription of a statin) ranged from 0% to 87.5% (median 31.8%). From the list of 61 practices in the CCG, a stratified sample of 14 was randomly taken, according to low (4 practices), medium (6 practices) or high (4 practices) levels of statin uptake (9 of the 61 practices that identified less that 6 high risk patients were excluded). Of these 14 practices, 6 agreed to participate in the study. Uptake in these 6 practices ranged from 11% to 64% (median 30%) – See Table 1.1

TABLE 1.1 Practice Sample

Practice	Responders	Responders on Statin		Total High Risk	Total on Statin		Survey Response Rate
		n	%		n	%	%
A	6	3	50	15	3	20	40
B	5	1	20	33	10	30	15
C	15	11	73	51	19	37	29
D	2	1	50	25	16	64	8
E	0			27	8	30	0
F	0			9	1	11	0
Total	28	16	57	160	57	36	18

Patient Sample:

Letters were sent to a total of 160 high risk patients at the 6 participating practices, inviting them to take part in a short telephone interview. 28 patients responded and completed the interview (a further 5 patients responded but did not complete the interview). The sample of patients interviewed was self-selecting, and was composed of generally older (93% 60 or over; 56% 70 or over) male (71%) patients, the majority of which were taking statin medication (57%) and unanimously described their ethnicity as white (100%) – See Table 1.2

TABLE 1.2 Patient Sample

		Responders	
		n	%
Sex	Female	8	29
	Male	20	71
Age Group	40-49	0	0
	50-59	2	7
	60-69	10	37
	>70	16	56
Ethnicity	White	28	100
Taking Statin	Yes	16	59
	No	12	41

GP Sample:

GPs at the 6 participating practices were also invited to be interviewed. 4 GPs, across 3 practices (practices A, B and C), were interviewed: the two GPs at the same practice were interviewed together.

Data Collection

Patients:

Telephone interviews with patients were not recorded, but notes we taken during and immediately after each interview. Basic demographic information for patients was recorded (Sex, Age, Ethnicity) as well as whether they were currently taking any cholesterol-lowering medication. All further questions in the telephone interview were open-ended. They broadly covered: satisfaction with GP; GP's communication generally, and specifically in the case of the Health Check; and Patient's attitudes to statin medication, including reasons for accepting or declining a prescription, knowledge or experience of side effects, and knowledge or concern about managing cholesterol level.

GPs:

Interviews with GPs were recorded from which a transcript and summary notes were written. GPs were interviewed after the majority of patients had been interviewed and questions were formed in response to preliminary analysis of the patient data. Again questions were open-ended. GPs were asked broadly about: their aims for the consultation; how they explain CVD risk to patients, and the trade-off between lower-risk and possible side effects; how they explain the relationship between statin medication and lifestyle changes; and how they integrate patients' values with evidence.

Data Analysis

Data from the interviews with patients and GPs was analysed thematically. The thematic categorisation of the data was not conducted on the basis on any stronger theoretical commitments than were necessary for generating the intuitively-salient interview questions. In that sense, the analysis proceeded 'inductively'. Furthermore the themes used to categorise the patient data were not exported, a priori, onto the GP data, or vice versa. Although clearly there is, as one would expect, much overlap.

Results

Patients:

Lifestyle modification

Almost all patients interviewed had discussed their diet and level of exercise, regardless of whether they accepted statin medication. Though whether the discussion took place with either or both the nurse or the GP, and whether the patient received written and, or, verbal information was variable – in the typical case, patients discussed their lifestyle with both nurse and GP, and also received written information from the nurse. Overall, as a result of meeting with both the nurse and GP, the majority of patients received both written and verbal advice about diet and exercise. Levels of concern about cholesterol level and heart health was also even between those who accepted statin medication and those who did not. Patients were also asked about concordance using a four question scale from Morisky et al (1986) and patients came out as `medium adherence'.

There was a consistent view among the patients interviewed that modification of lifestyle factors was a preferable way to manage their cholesterol and heart health, and indeed some patients believed these were the most important factors. In this respect there was a difference between those patients taking statin medication and those not: those not taking a statin spoke about lifestyle modification in terms of a "challenge" or "vow" and something they wanted to do for, or "prove to", themselves. In contrast, of those patients who were taking a statin and believed that lifestyle modification was an important part of managing their cholesterol many held the view that their diet and level of exercise was already adequate; despite many also noting their occasional 'naughtiness' in relation to diet.

There was also a temporal difference between some of those patients taking and not taking a statin. Patients not on a statin sometimes reported that they had decided with their GP to try lifestyle modification first, which would then later be re-assessed. Some patients who were taking a statin reported being at a later stage of this same process, that is, having tried lifestyle modification and then subsequently accepted statin medication (this is noted in the limitations section below).

Views about medication

Almost all patients not taking a statin expressed a preference to avoid medication if possible. Notably, many of those patients also thought they would be happy to take medication if it was necessary; but believed as a result of discussion with their GP, that is was not (or not yet) necessary. Most patients who were taking a statin had the opposite view and reported they were happy taking medication. They cited a number of reasons why, such as "lowering risk" or avoiding a heart attack, as well as believing that it was necessary (sometimes despite the fact they would prefer not to take medication, or because they were previously unsuccessful with lifestyle modifications).

Side-effects

Patients not taking a statin had relatively little to say about the side effects of statins, and their general level of concern about side-effects was low. Only two patients cited possible side-effects as the reason why they declined statin medication. Overall, equal numbers of patients thought that potential side-effects were well or poorly explained to them. Similarly there was a roughly even split between good and poor explanations of side-effects among those patients who had accepted statin medication. And again, the general level of concern was low; even among those who had experienced side-effects themselves. Across all patients, whether taking a statin or not, information about side-effects came from the same range of sources: the experience of friends and family, pharmacists and the leaflets that come with the medication, as well as what was given to them by the nurse at the initial screening, or later by the GP.

Trust and Choice

The majority of patients who were not taking statin medication stated this was because they had decided in conjunction with their GP to try lifestyle modification first. They frequently made reference to the fact that the GP was very supportive of their preference for making lifestyle changes, and that they felt well monitored and well looked after by their GP. Only one patient complained of their GP's “statin or goodbye” attitude. In contrast to this, patients taking statin medication cited their trust in their GP's advice as the primary reason for accepting it. Many patients expressed the view that they “trust utterly” their GP, or that one must “go along” and “not argue” with the GP. Again patients reported that they felt well monitored, but this was instead related back to the idea that the GP 'knows best', rather than supports their preferences.

GPs:

Aims

All the GPs interviewed shared the straightforward aim for their consultations with high risk patients, which was to: “modify all of the modifiable risk factors, if I can, for the benefit of the patient” (GP3), depending on the patients' risk factors. All the GPs emphasised that they aim to explain and get the patient to understand the benefits and risks of statin medication; reiterating the discussion the patient would have had previously with the nurse. Other things equal, one GP explicitly stated that their aim is: “[to] get people with cholesterol onto a statin, because I think that's one of the best ways of approaching it” (GP3).

Discussion of both lifestyle modification and statin treatment was said to be a feature of patients' interactions with both the nurse initially and GP later. While the division of labour between nurse and GP, in terms of who gave different kinds of advice, differed according to the GPs interviewed, in general the GPs stated that they try to reiterate much of the discussion that had been started by the nurse. All GPs held the view that their discussion with the patient should cover the full range of treatment options. For example: “you wouldn't just give somebody a medication without advising them... [you] wouldn't give someone a statin without the associated lifestyle advice, you would also say you can help yourself to by doing x, y, z” (GP1). However one GP noted that they try to focus more heavily on the “the prescribing and pharmacological side” of treatment, leaving lifestyle advice mostly to the nurse, so that “lifestyle advice [is] given as a baseline... [to be] built

upon later on" (GP4). Indeed some GPs reported that additional written information about statins was sometimes given to patients, the content of which went beyond the nurses "shiny leaflets".

Barriers to uptake and concordance

GPs referred to a number of reasons why patients might be reluctant to accept (or continue) statin medication. All GP's noted that they see patients who are sceptical about the need for a statin, or concerned about taking a statin.

The foremost reason given by GPs was patients' worries of side-effects, often based on the experiences of friends or family and also often exaggerated. More generally GPs felt that patients' concerns were often based on misinformation: two GPs singled out the Daily Mail in particular as a source of misinformation about statins. One GP noted that dealing with these misunderstandings often gets in the way of the discussion they want to have with the patient: "it's quite a pain to be going through that, at times" (GP4). Also food labelling was noted as an issue, when products such as Benecol over-promise their benefits and can give patients the wrong idea. Similarly, apparently contradictory advice given by a patient's previous GP was noted as something that needed further discussion, for example, around the need to explain that the patient was now older, which itself increased their risk.

Poor concordance was also partly blamed on experience of side-effects, or the slightly greater inconvenience of night-time dosing. However GPs put much more emphasis on concordance problems resulting from poor explanations of statin treatment, particularly the reasons why patients were taking it and what to expect in advance. For example, explanation of the fact that the patient may not feel ill because it is their risk that is being treated was seen a key part of maintaining concordance. Also, the GPs felt clearly that if the possible side effects are not explained in advance, then patients may have problems and give up without contacting them. All GPs stated that patients' attitudes towards medication and concordance crucially depended on the quality of the discussion they had with their GP.

GPs expressed a mixed attitude towards the efficacy of lifestyle changes. While the GPs thought that lifestyle changes have a "definite role" (GP4) to play in managing risk and that patients may be able to lower their risk without needing medication, most thought that lifestyle changes were difficult to sustain. One GP explicitly stated that leaving high risk patients to just make lifestyle changes made them "uncomfortable" (GP4), and other GPs talked judging whether a patient was able to make the required changes. For example, one GP stated: "[you consider how] realistically they [the patient] would be able to achieve the changes in their diet and lifestyle" (GP2). The effect size of lifestyle changes was also questioned: "in terms of exercise and diet changes... you're thinking to yourself, your [the patient's] total cholesterol is 6.5, it's going to come down to 5.5 in an optimistic scenario" and later: "can it [lifestyle changes] completely reverse it [being at high risk] – no" (GP4). More specifically, the efficacy of diet changes was questioned by one of the GPs: "[I am] pretty sceptical about diet having any effect", however "exercise and weight loss, those are things I will push most" (GP3). Furthermore, in relation to exercise, the level of activity patients engage in was also highlighted;

simply walking regularly was not viewed as being sufficient, although patients may think it is.

Facilitating uptake and concordance

All GPs expressed a consistent view about how to facilitate uptake and concordance with statin medication.

Properly explaining the benefits and risks of treatment to the patient was unanimously thought to be the a key part establishing trust and thereby facilitating uptake and maintaining concordance: “If you've had a good quality discussion with them at the beginning and they know what to expect then they're much more likely again to trust what you're saying” (GP1). GPs thought an explanation of risk, which helped the patent to understand what is meant and achieved by modifying risk factors enabled patients to choose the best treatment option. For example: “[good explanation] helps them [that patient] place the question of cholesterol medication in their own framework of values” (GP3).

All the GPs mentioned particular strategies for explaining the benefits and risks to patients, in a way that facilitated uptake and concordance. Most simply, the GPs noted that concerned or sceptical patients are given different kinds of explanation: “I would tailor the discussion to the patient depending on whether they had told me or whether I suspected that they were a bit sceptical about taking medication” (GP1). For example, placing particular emphasis on the idea that it was overall risk that was being targeted. Hence, GPs noted that they spent time explaining to patients that they may not feel ill now, or have particularly high cholesterol, but never the less – because risk was calculate from multiple factors – could still be high risk. Similarly GPs stated that the potential side-effects of statin treatment were introduced in the discussion even with unconcerned patients, on the basis that making patients aware of what they might experience and the ways that it could be dealt with by the GP, made them more likely they to work with the GP to continue treatment if they experienced side effects.

More concretely, GPs explained that they discussed risk with patients by using specific examples such as imagining '10 people in a room' or '5 people just like you', or as one GP expressed it, using a boiler metaphor: “you don't let your boiler get sludge in there” and by servicing it “you're not curing it, you're preventing it”, emphasising that “the boiler is going to breakdown, if you don't do anything about it” (GP4). It was also stated that explanations referring to the number-needed-to-treat, rather than percentages were more likely to aid patients' understanding. The use of diagrams or decision-aids was further noted as being useful because they: “[help patients see the importance of] why we make a fuss about it [cholesterol level], and why we want to include them in the green bunch [referring to the smiley faces on the decision aid]” (GP3). Although one GP noted that the decision-aids could sometimes backfire because “if you're talking about 30% risk or 25% risk there are more smilies regardless” and because “[patients say] these patients would remain smiley anyway, whether they take the tablet or not” (GP4).

All GPs emphasised that in addition to providing a good explanation of treatment options (which in itself was claimed to facilitate uptake and concordance) the process of negotiation and shared decision-making with

patients was also key. For example: “I think including people and making it an open discussion rather than a prescriptive 'I think you should, need, to take this otherwise you'll die of a heart attack'... means that nearly everyone I personally start on statin still takes it, as long as there is no reason for them not to” (GP3). Including patients in a negotiation about their treatment was linked to a number of other ideas. For example one GP linked it to increasing trust: “They [patients] trust what you're saying if you've negotiated with them” (GP1), while another put the negotiation in terms of ownership: “you don't want a confrontation, you want someone to work along... [so] it's his [the patient's] ownership, not my agenda... if it is me, they'll never do it [lower their risk]: make them own it and then they push you to do something about it” (GP4). The same idea was put in terms of responsibility as well, where the negotiation process is used to highlight that it is “as much their responsibility as ours [to manage their risk].” and that “it is not just up to me to fix your Qrisk” (GP2). In relation to concordance, the GPs thought that negotiating with patients would encourage them to monitor things themselves, come back to the GP with any problems, and want to do what they can to help themselves.

One important strategy in the negotiation with patients about their treatment, especially the concerned or sceptical patients, was an initial attempt at lifestyle modification before starting medication. For example, one GP states that “most people would have that period of trying lifestyle, unless they had a major risk factor” (GP2), the advice from another GP being that patients would: “try it [lifestyle changes] for three months time, [or] six months time, [then] we'll recheck it [risk]” (GP4). Indeed, to demonstrate this negotiation with patients, one GP talked about certain 'catchphrases' they used such as: “The last thing we want to do is to lumber you with medication when you don't need it” and “I want to give you the opportunity to modify this in other ways, before we resort to that [medication]” (GP1). The purpose being to give patients the opportunity to try their preferred treatment options first; which again was cited as being important for maintaining concordance later on, as one GP claimed: “yes you give in when they want to try lifestyle, but then they own the problem and they come back to you wanting to do something else” (GP4)

A further negotiation strategy used by GPs concerned patients experiencing side-effects from statin medication. GPs reported that in some cases they “negotiate a break” (GP1) or “drop a dose” (GP2) of a patient's medication, as a means to test whether problems are statin related. Negotiating these breaks or reductions for a set period of time was used to keep the patients 'on track'. GPs stated that patients stopped taking medication themselves because of problems, and so by the GP initiating a break or reduction, the patient could be monitored and treatment re-adjusted later. For example, one GP emphasised “working along with them [patients experiencing side-effects], in terms of, if they want to reduce the dose to try it first, but then you have to go back at it and bring it back up again in three months time, six months time, and ask them 'what's happened, how are you getting along?'” (GP4).

The negotiation with patients was seen as the best way for GPs to use their expertise to integrate the patients' values into the treatment decision. GPs noted that in addition to the concerned or sceptical patients, for some patients, the choice to accept statin medication could be their first long term medication, and so

being sensitive to those concerns was important. The importance of patients' values was further underlined by one GP's claim that by recommending medication or lifestyle changes “we may be having an impact on the quality of life [of the patient] in ways we hadn't intended”, and who therefore stated that they avoided being paternalistic about treatment options. Indeed even though some patients' values may seem 'unreasonable' or a poor justification for avoiding statins one GP noted that “if that's what he [the patient] values above being a green smiley face, that's his decision” (GP3). Other GPs gave examples of hypothetical patients, for whom they would alter the explanation of treatment options in response to their values. For example, one GP talked about a patient who “absolutely detest[s] taking tablets... you may say to that person, well you're a smoker and actually if you modify that then you can reduce your risk quite considerably” (GP1).

When to prescribe

The GPs presented more mixed views on whether patients on the borderline of being high risk should be advised or treated differently. In some cases borderline patients were thought of as giving a GP more flexibility with treatment options. For example, one of the GPs interviewed stated that their approach to borderline patients “depends on what you have to play with [in terms of risk factors]” (GP2). Similarly in relation to the NICE guidelines (National Institute for Health and Clinical Excellence 2010) another GP noted that “I treat guidelines as exactly that, as a guide... there are no clear rules” and later said that “if it [Qrisk] is just above or below 20, then there's no magic cut off” (GP1). In contrast other GPs expressed the view that patients with a Qrisk between 15-20% ought to be thinking about their heart heath and statins; indeed, one GP stated that all borderline patients, between 15-25% “should be on a statin” (GP4).

In relation to this, the GPs also highlighted the shift from absolute numbers, such as cholesterol level, to risk measures. Saying for example that “these days we don't treat the numbers in the same way that we used to” and that “it's not just if you're cholesterol is high you're offered a tablet” (GP1). Equally however, another of the GPs also stated that they still like to invite back patients found to have high cholesterol, even if their Qrisk is below 20%, so that the discussion about heart health can begin.

The GPs were consistent in their views about higher risk patients, and all stated that they recommend statin medication more strongly with those patients. For example if the Qrisk was over 25% it was thought that “it is a given that you're [the patient] going to have a statin” (GP2), and other GPs talked in terms of a “need to be realistic with them [the patient]” (GP1), or challenging patients' preferences by asking “do you *really* not want to take this?” (GP4).

Discussion

Summary of Main Findings

- Patient uptake was associated with trusting and accepting GP's advice. There was less uptake among patients who reported greater shared-decision making with their GP.

- Few patients expressed serious concern about the possible side-effects of statin medication.

- Some patients felt strongly about trying lifestyle modification in the first instance; seeing this as a personal challenge.

- GP's believed that non-paternalistic and shared decision-making approaches were crucial to facilitating uptake and ensuring subsequent concordance with statin medication. Key aspects of this were:
  - A good explanation of risk, and why patients therefore need a statin.
  - Pre-emptive explanation of possible side-effects and how they can be dealt with.
  - Negotiation of treatment options with the patient, in order to encourage trust, ownership and responsibility. In particular (1) integration of patient values, even if they may not seem 'reasonable', (2) period of trying lifestyle modification prior to starting statin medication, (3) breaks or reductions in statin medication following experience of side-effects.

The results from this small qualitative study suggest a tension between the dual aims of increasing patient choice and increasing uptake of statin medication. The results from the GP interviews demonstrate that negotiation with the patient about treatment decisions is crucial for uptake and concordance; though this appears to carry with it greater variation in uptake as patients try alternatives to statin medication in the first instance. Conversely, the failure of concordance or uptake that GP's thought was most significant, was due to poor explanations of statin treatment and lack of shared decision-making. The results from patient interviews suggests this does happen but, encouragingly, is not typical. These results however require verification in larger more representative samples.

Implications for Practice

From one email response: “Implications are that a) the choice agenda is likely to increase clinical variation b) where this is the case clinical variations shouldn't necessarily be regarded as `unwarranted' - though as the CCG is also measured against `outcomes' there should probably be a follow up on those patients who choose lifestyle change. “

Limitations

The sample of patients was self selecting and clearly skewed towards older, white males. The sample is not representative of the practices' populations. This is problematic because the patients in the sample who

were taking a statin reported that they did so mostly because they always trust and followed their GP's advice. This is known to be a characteristic of older patients (Vick & Scott 1998), however younger patients - under represented in the sample - may accept statins for different reasons. Response rates for this study were low and difficult to engineer to be more representative. Future research may wish to employ other survey methods, for example, questionnaires which, while less rich in qualitative terms, may lower the barrier to participation and thereby encourage a larger response from patients. This would also serve as a useful corroboration of the results by a different kind of evidence, if results were consistent.

It became apparent during the study that following the Health Check consultation with the GP there may be a period of time where the patient tries lifestyle modification before statin medication. The patients interviewed did not all have their Heath Check at the same point in time, nor was the date of the Health Check recorded as part of the study. Consequently the association of lower uptake and greater shared-decision making could be a result of those patients not on statin medication being interviewed 'too early'. More generally, there may be systematic differences in patient responses, depending on how recently they had their Health Check. This was not controlled for in the present study. Future research should record the date of Health Check in each case and check findings for temporal correlations.

This is also related to a second concern. Patient preferences, for example for lifestyle modification as opposed to statin medication, were all self-reported. The primary reason this is a concern in the present study is that there is no way to discriminate whether treatment decisions reflect patient's stated preferences or whether the patient's stated preferences follow the treatment decision. For example, most patients interviewed expressed a preference to avoid medication unless it was necessary, but it is not clear whether there judgement about whether it is necessarily is a consequence or a cause of whether they are receiving statin treatment. Future research could investigate this through follow-up and 'tracking' of patients, and by being more closely tied to the timeline (consulting nurse, consulting GP, initial treatment, 3 or 6 month follow-up) which patient's follow.

GP's views on their practice were also self-reported. Through interviewing patients as well, the present study included some further validation of whether the GP accounts of how they interact with high risk patients reliably reflected that interaction. However, the present study is less robust in comparison to other more observational ethnographic methods. Future research could explore the doctor-patient interaction more directly through these methods.

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