HY-Quest, standardized patient questionnaire to be completed at home before a first visit for hypertension: a validation study in specialized centres in France

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Objective: To evaluate a patient questionnaire (HY-QUEST) to be completed at home before consulting in a hypertension clinic for the first time.

Methods: HY-QUEST is a questionnaire translated into patient language of the items from a standardized computerized medical record used since 1975 and regularly updated. This questionnaire contains 97 closed and seven free-text questions designed to evaluate cardiovascular risk and possible secondary hypertension, and to guide therapeutic strategy. One hundred and thirty-three new patients were asked to complete it at home and to bring it with them to their first visit in the hypertension clinic. The primary end-point was completeness of the answers. Other end-points were legibility and correctness of the answers.

Results: Questionnaires were available for 128 out of 133 patients (96%). More than 80% of the 97 closed questions were answered in 121 out of 128 questionnaires [94.6%; 95% confidence interval (CI) 90.7–98.5] and no question had a response rate less than 85%. The answers were legible in 85% of the closed questions and the concordance rate with the physician's assessment was 94%. Among the 101 treated patients, 72 (71.3%; 95% CI 62.5–80.1) were able to provide the correct names, doses and schedule of their antihypertensive treatments.

Conclusion: The HY-QUEST questionnaire can be completed by most patients with few missing or incorrect answers. It is well accepted by patients and provides useful information to orient the first consultation in a hypertension clinic. Whether the same approach is feasible and useful in primary care remains to be investigated.

Keywords: hypertension, medical history, medical records, patient questionnaire, preinterview

Abbreviations: BP, blood pressure; ESH, European Society for Hypertension; SFHTA, French Society for Hypertension

INTRODUCTION

Hypertension affects around one-third of the adult population in the western world and thus represents a considerable burden on healthcare systems. Guidelines recommend a simple, systematic evaluation for the initial management of hypertensive patients [1]. In most cases, this evaluation is carried out during an outpatient visit with a general practitioner or specialist. Given the chronic nature of cardiovascular diseases and the large number of patients, this initial assessment plays an important part in consequent patient, and costs, management.

Decisions regarding the management of hypertensive patients depend not only on blood pressure (BP) but also on associated cardiovascular risk factors and complications of hypertension, suggestive signs of secondary hypertension, adverse events while taking previous medications and comorbidities. An initial interview with the patient is currently essential to obtain these elements and should be included in the patient's medical files. Clinical practice guidelines highlight the importance of this interview. However, although they specify the nature of the data, they do not specify the way in which they should be collected, despite the need for a standardized approach [1]. We developed a preinterview questionnaire, called HY-QUEST, to be filled in at home by patients consulting for the first time in a hypertension clinic. The questionnaire was designed to standardize and facilitate the visit with the physician. The aim of this work is to describe the development and validation of the questionnaire.

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MATERIALS AND METHODS

Development of the questionnaire

In 1975, a standardized computerized medical record was established to manage patients consulting in the Hypertension Clinic of Broussais Hospital (Paris, France) [2–4]. It has been in daily use ever since for both clinical practice and research purposes. This physician-completed medical record has changed over time to reflect changes in recommendations [5]. It includes seven subsections designed to evaluate cardiovascular risk, identify secondary hypertension and guide treatment decisions: patient's history of hypertension; other cardiovascular risk factors; drug tolerability and allergies; personal medical history with cardiovascular and renal focus; current drug treatments; lifestyle and diet; and family medical history with a focus on cardiovascular risk factors and premature cardiovascular diseases.

We used all the items included in the standardized and computerized medical records to establish the patient questionnaire, HY-QUEST (appendix 1, http://links.lww.com/HJH/A301). It contains 97 closed questions (mutually exclusive yes/no/do not know answers), with requests for additional information when needed, and seven optional free-text questions, including questions about current medical treatment (name, dose and number of daily intakes). Patients were asked to answer 'I do not know' if they had difficulties understanding the question rather than to risk giving an incorrect response. For practical reasons, HY-QUEST focuses on objective data and does not include subjective questions. For example, the part of the questionnaire dealing with drug tolerability focuses exclusively on specific adverse events of antihypertensive drug classes, without dealing with issues related to treatment compliance for which other questionnaires are required [6].

The questions are written in a language that is suitable for the patients and their families. To correct possible ambiguity in the wording, patient comprehension of the questions was first assessed in 2005 in a preliminary pilot study with 30 patients interviewed face-to-face. The questionnaire has since been used in routine practice to manage patients consulting for the first time at the Hypertension Clinic of the European Georges Pompidou Hospital (Paris, France). It has been regularly updated over 5 years (2005–2010) on the basis of comments from patients and physicians. The questionnaire is well accepted and takes approximately 30 min to complete. With a view to extending the use of this questionnaire to other centres (tertiary care), we submitted it to experts from other French hypertension clinics accredited as Excellence Centres by the European Society for Hypertension (ESH). No major modifications were suggested.

Methodology of HY-QUEST evaluation

In 2010 and 2011, the first 20 or 30 consecutive new patients who had been scheduled to attend appointments for hypertension with any of seven physicians from five French Excellence Centres were sent the questionnaire beforehand. The questionnaire is a paper document of nine A4 pages and the patients were asked to complete it at home before their first visit and to bring it along with them. They were encouraged to ask for help from their family if required. The patients were free to choose whether or not to complete the questionnaire. During the visit, which took place in the usual manner, the physicians compared the data collected during the interview with the written responses of the patient on the questionnaire. They noted their observations (discordance or additional information) in a space reserved for this purpose on the questionnaire that was left blank if the answers matched. All the questionnaires were then reviewed and analysed by one of the authors (N.P.-V.).

End-points

The primary end-point was the response rate for each question or completeness.

Other end-points were:

1. the overall questionnaire return rate or feasibility;
2. the rate of readable responses or legibility;
3. the concordance rate with the physician's assessment. The oral responses to the physician's questions during the visit and documents (previous laboratory and/or radiology results) brought by the patient were used as a reference. Discordances were classified into three groups according to their potential impact: discordance with no or minor clinical consequences for management (type A), omission or error concerning an item of information useful in practice (type B) and error with potentially harmful consequences (type C);
4. the number of patients able to provide information about their treatments. This was evaluated by three types of information: the name of the drug, its dose and the number of intakes per day.

Statistical methods

For the primary end-point related to the completeness (response rate for each question), we described the number and percentages with the corresponding 95% confidence interval (95% CI) of patients who answered all the 97 closed questions, 80–99% of them, or 60–79% of them or less. The sample size was calculated so that the lower bound of the 95% CI of the proportion of patients with more than 80% answers to the 97 closed questions would be greater than 66% (considered as the acceptable proportion limit for such a programme), assuming that the observed proportion would be at least 75% (as per our previous experience). At least one hundred and six individuals were needed.

RESULTS OF HY-QUEST EVALUATION

Feasibility

One of the centres was excluded from the study for protocol violation, as the patients were asked to complete the questionnaire in the waiting room just before the visit rather than at home (these data were not included in the analysis). Thus, the evaluation concerned six senior physicians at four French hypertension centres (Bordeaux, Grenoble, Paris

TABLE 1. Patients' characteristics

	$N = 128$
Age (years)	55.9 ± 9.0
Men	65 (51)
Hypertension duration >1 year	102 (80)
Office blood pressure (mmHg)	142 ± 19/83 ± 11
Patients on antihypertensive treatment	101 (79)
Antihypertensive drugs	2.2 ± 1.1
Patients on antidiabetic treatment	12 (9)
History of coronary disease	5 (4)
History of cerebrovascular disease	14 (10)

Data are mean ± standard deviation or *n* (percentage).

and Poitiers). Five of these reviewed the questionnaires of 20 patients and one reviewed 30 questionnaires. All 133 patients asked to complete the questionnaire agreed to do so. However, two forgot the questionnaire at home, two others cancelled their appointments and one questionnaire was missing for unknown reasons (either forgotten by the patient or lost by the centre). Consequently, 128 (96%) questionnaires were available for analysis.

Population

The characteristics of the 128 patients who brought their questionnaires are summarized in Table 1. They were 55.9 ± 9.0 years old, and 51% were men. The mean office BP was 142 ± 19/83 ± 11 mmHg and 21% had no antihypertensive treatment at the time of their first visit. Fifty-six percent had a home BP monitor. The patient's occupation was known for 95 patients. This information is summarized in Table 2 according to the international standard classification of occupation (Isco-88). Not all of the patients spoke perfect French and one was deaf-mute; these patients were offered help to complete the questionnaire at home if required. Three patients of a low education level asked for help from their general practitioner.

Completeness

All the 97 closed questions were answered in 33 (25.8%; 95% CI 18.2–33.4) cases, 80–99% of the questions were answered in 88 (68.8%; 95% CI 60.8–76.8) cases, 60–79% of the questions were answered in four (3%; 95% CI 0.1–5.9) cases and less than 60% of the questions were answered in three (2%; 95% CI −0.6 to 4.4) cases (Fig. 1). Thus, more than 80% of the 97 closed questions were answered in 94.6% (95% CI 90.7–98.5) of the 128 questionnaires analysed.

TABLE 2. Distribution of patients' occupations

Occupations ($n = 95$)	%
(1) Legislators, senior officials and managers	11
(2) Professionals	24
(3) Technicians and associate professionals	4
(4) Clerks	10
(5) Service workers and shop and market sales workers	20
(6) Skilled agricultural and fishery workers	0
(7) Craft and related trades workers	4
(8) Plant and machine operators and assemblers	9
(9) Elementary occupations	6
(10) Armed forces	0
(11) No occupation	10
(12) Students	2

Adapted from the International Standard Classification of Occupation (Isco-88).

Legibility

Around 85% of the 97 closed questions were answered comprehensibly. Table 3 shows the seven questions with a missing response rate at least 10%. Checking responses by questioning during the visit revealed that the lack of a response to a question was mainly because the patient did not know the answer.

Concordance

The answers to the 97 closed questions were considered concordant if they met the following three conditions: the answer was present, legible and consistent with the physician's assessment. The concordance rate was 94%. The highest divergence score (10%) was obtained for the question concerning the year of onset of hypertension. Only one type C (potentially harmful impact) discordance was noted. In this case, the patient reported taking no antihypertensive medication, despite having been prescribed one. Six different type B discordances and 19 different type A discordances were noted, all detailed in Table 4.

Description of treatments

Seventy-two of the 101 patients (71.3%; 95% CI 62.5–80.1) receiving antihypertensive treatment were able to provide the name, dose and dose schedule in daily intakes of their antihypertensive treatments (perfect concordance for all three criteria). Among the remaining 29 patients (28.7%; 95% CI 19.9–37.5), 19 (19%) did not give the names of the drugs they were taking, 27 (27%) had omitted the dose and 20 (20%) did not provide the number of daily intakes (Fig. 2). For the 26 patients (26%) taking cholesterol-lowering drugs, 13 (50%) gave perfectly concordant responses (name, dose and dose schedule). The question that had the highest divergence between the answer in the questionnaire and the physician's assessment was about the regular

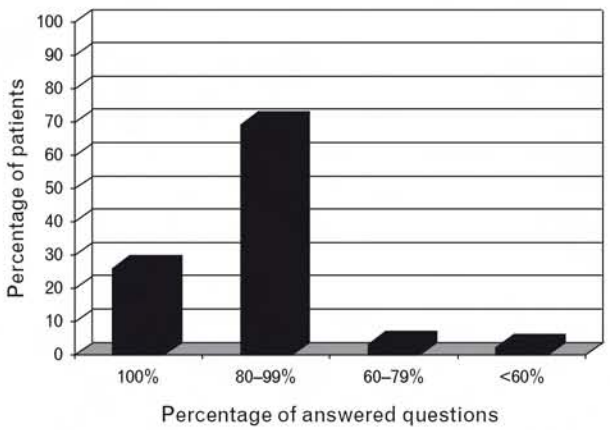

FIGURE 1 Completeness: capacity of the patients to answer all 97 closed questions.

TABLE 3. Questions with missing response rate at least 10%

Question	Missing response rate (%)
Has a physician ever told you that you had painful or swollen breasts because of a BP-lowering drug?	14
Has a physician ever told you that you had sexual problems because of a BP-lowering drug?	11
Has a physician ever told you that you had Raynaud's syndrome (very cold and painful fingertips) because of a BP-lowering drug?	11
Do you take aspirin regularly?	11
Has anyone ever told you that blood testing showed that you had an abnormal potassium level?	10
Have you ever had a heart attack?	10
Are you currently taking any drugs (tablets or injections) for diabetes?	10

BP, blood pressure.

intake of aspirin (15% of patients). This question gave rise to two types of error: some patients confused paracetamol and aspirin, whereas others were unaware that their antiplatelet drug was based on or included aspirin. Inaccuracies and absence of information concerning dose often related to combined treatments (e.g. patients indicated 'Pill X, 20' rather than 'Pill X, 20/12.5').

DISCUSSION

The patient questionnaire 'HY-QUEST' is both feasible as a tool to help prepare a patient's first visit to a hypertensive clinic and well accepted by the patient. Ninety-six percent of the questionnaires were brought to the visit. Overall, more than 80% of the 97 closed questions were answered in 94.6% (95% CI 90.7–98.5) of the 128 questionnaires analysed. This was higher than our initial hypothesis of a completeness rate of at least 66%. The questionnaire was generally well understood with 85% of the 97 closed questions readable. Furthermore, the answers were reliable, as 94% were consistent with the physician's interpretation.

Similar studies of the use of self-assessment questionnaires have been carried out in other clinical domains and have documented the benefits of this approach in terms of the quantity and quality of information collected and the time made available for dealing with the most important problems [7]. However, to our knowledge, this is the first

TABLE 4. Incorrect answers given by the patients and possible repercussions for management

Type of error	Nature of the discordance
Type A: Discordance with minor or no clinical consequences for patient management	Discordance between physician and patient concerning the year in which hypertension began
	Cardiovascular history: YES ticked when the correct response was NO (same for depression and Quincke's oedema)
	Patients declared taking ephedrine nose drops when they should have responded NO
	No response (not even 'I don't know') to the question about allergy, whereas the physician had noted an allergy to penicillin
	Underestimate of the number of cigarettes smoked (6–7 per day, versus 10–12 noted by the physician)
	Error in the age at which the patient's mother died (65 rather than 69 years)
	Declared taking liquorice when the correct response was NO
	Incorrectly declared having a home blood pressure monitor (should have responded NO)
	Incorrectly declared having high cholesterol levels
	Incorrectly declared having Raynaud's syndrome
	Declared having an abnormality in the thyroid blood test when should have answered NO
	No response to the question 'Do you have kidney stones?' whereas responded YES in the history section
	The patient forgot to report hypertension in a brother
	Patient declared having had depression leading to hospitalization, whereas the physician noted a depressive episode without hospitalization
	Patient declared having no cholesterol-lowering medication, but gave the correct name, dose and intake schedule for a prescribed statin
	Incorrectly declared having a brother or sister who had undergone adrenal or thyroid surgery
	When asked for the name of the brand of aspirin taken, the patient responded 'paracetamol'
	Confusion between paracetamol and aspirin for headaches (written in full in the response)
	Declared having 'had an X ray', but in the subquestion seeking details, confused arteriography and a Doppler scan of the renal arteries
Type B errors: Omission or error concerning a detail of use in clinical practice	Declared not taking aspirin, when should have responded YES (similarly, in another case, the response was NO but Kardegic was noted in the prescription section)
	Incorrectly declared not having Raynaud's syndrome
	Incorrectly declared not taking cholesterol-lowering medication
	Ticked NO for a history of depression, whereas had been hospitalized for depression
	Said had never smoked when had smoked for 8 years in the past
	Declared having no history of hepatitis, whereas the physician said YES
Type C error: with potentially harmful consequences	Declared having no antihypertensive treatment when should have responded YES

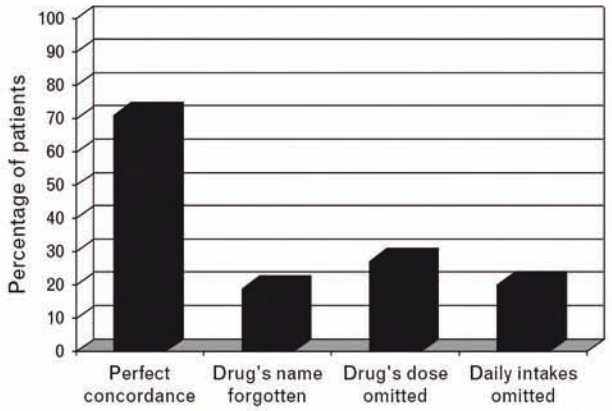

FIGURE 2 Capacity of the 101 patients on antihypertensive treatment to complete the details of the name, dose and dose schedule in daily intakes of their antihypertensive treatments (perfect concordance for all three criteria).

study of the use of such a questionnaire in the domain of hypertension.

The advantages of using standardized medical records have been described elsewhere [8]. HY-QUEST not only helps prepare the patient for his or her visit but is also a useful check-list for the physician, thus contributing to the completion of medical records [8]. As such, it serves as a guide for structuring interviews with patients. Other authors have suggested that there may be a beneficial 'check-list' effect in cases in which the medical observation is not already standardised [9].

It is important to note, however, that such a questionnaire is not designed to replace questionnaires (self-administered or otherwise) for screening, risk evaluation, diagnosis or treatment follow-up. Many such questionnaires have been validated, particularly for alcohol consumption, nicotine dependence, sleepiness and anxiety [10–13]. Furthermore, questions about symptoms that might involve patient perception (e.g. fatigue, breathlessness, anxiety, pain, headache and so on) would require the use of other specific scales. Consequently, HY-QUEST does not contain questions about symptoms of secondary hypertension (as recommended in the Guidelines [1]), as we esteem that these are best covered during the physician interview.

None of the questions was associated with a particularly high level of nonresponse or divergence, although systematic oral verification of the patients' responses before entering the details in medical records remains essential. As mentioned above, the goal of the questionnaire is not to shorten the interview but to prevent omissions and to guide the interviewer more directly to the problems reported.

According to Bachmann [7], there is no reason to think that the time spent in exchanges with the patient on the information noted by the patient before the interview is any less profitable than an interview without prior preparation. We suggest, but without proof, that this approach frees up time for more personalized dialogue with the patient concerning his or her history and management.

The good quality of the responses observed in this survey may reflect the fact that patients are encouraged to consult their medical files and to get help from their families or general practitioner. Previous experience outside the scope of this survey – the questionnaire has been used in routine practice since 2005 – has also shown that this approach is particularly useful for non-French speaking patients assisted by an interpreter among their friends or family. Furthermore, patients with handicap also benefit: a deaf-mute patient and a patient suffering from aphasia, who completed this questionnaire in our centre, were delighted to use this written form of dialogue with the physician, an advantage also cited by Bachmann [7].

Limitations

This work has several limitations. One might question the particularly small number of questionnaires forgotten by patients at the time of visit (1%). This probably reflects the quality of the information provided by secretaries and nurses in the context of this survey, but is also probably due to the fact that the patients themselves see their first visit at a specialist centre as an important moment and are, therefore, motivated to comply. Although we did not ask for precise information on educational and socio-economic status, the distribution of the patients' occupations (Table 2) suggests that the sample of patients were representative of a typical population. As mentioned above, patients were consecutively included in the study when they made their first appointment and we had no refusals. However, we do not know whether the four participating centres are truly representative of all 12 French Excellence Centres.

We did not evaluate the added value of this approach in terms of the quantity or quality of information collected. Neither did we quantify its possible effect on the visit. The interview with the physician and the documents brought by the patients were used as the reference.

Finally, the French questionnaire was translated into English for the purpose of this article. The version presented here has not been evaluated for legibility for English-speaking patients.

Perspectives

We demonstrate here the feasibility, high level of completeness and concordance of a new approach in the management of hypertensive patients by using a self-completed questionnaire. The number of 'I don't know' responses could be further limited by asking the referring physicians to help their patients complete the questionnaire before their appointment.

HY-QUEST was developed, updated and is currently used in a specialized Hypertension Unit Centre context (tertiary care). Its potential usefulness and acceptability in primary care require further research. It could be less successful due to differences in appointment organization or in patient motivation.

Nevertheless, we now consider the feasibility and informativeness of HY-QUEST to be established and have designed a website (HY-QUEST.com) that aims to assess the possibilities of administering an electronic version of the questionnaire. However, Slack *et al.* [14] have shown that computerized preinterview approaches for patients at home are still at the experimental stage. The next step will be to evaluate the impact of this new tool on patient

satisfaction and from the physician's perspective (time-saving, reminder, healthcare organization).

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Conflicts of interest

There are no conflicts of interest.

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Reviewers' Summary Evaluations

Reviewer 1

The patient's history remains an important step in a first consultation for hypertension. In the present paper, the authors have evaluated the feasibility and completeness of an exhaustive questionnaire (97 items) sent to patients before their hypertension consultation. Their results show that the questionnaire was well accepted by patients and was filled in reliably by patients when data were confronted with those obtained during the physician's interview. The questionnaire provided important information on concomitant diseases and treatment, side effects of drugs and actual treatment. This preliminary investigation demonstrates the feasibility and acceptance of such an approach, but more work is still needed to evaluate the added value of the procedure and particularly the feasibility in a much larger setting with patients speaking different languages and belonging to various socio-economic contexts.

Reviewer 3

The strengths of this paper lie in its novely and in the interest it would generate among physicians who run specialist hypertension clinics. It could also be very valuable for physicians working in low resource settings. Its main weakness at present is that it does not adequately describe the patient population involved in the research.