How accurately do primary health care professionals use cardiovascular risk tables in the management of hypertension?

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SUMMARY

It has been suggested that use of cardiovascular risk tables in hypertensive patients might improve clinical management. As part of a randomised controlled trial, we evaluated the accuracy of health professionals' use of the New Zealand risk tables in primary care consultations. Chance-corrected agreement between health professionals' assessments of absolute risk was only moderate (weighted kappa = 0.56 at the 12-month follow-up). Inaccurate use of cardiovascular risk tables may be a barrier to effective implementation of research evidence in the management of hypertension.

Keywords: hypertension; cardiovascular risk tables; accuracy.

Introduction

BRITISH Hypertension Society[1] and other[2,3] guidelines for the detection and treatment of hypertension acknowledge the importance of incorporating other risk factors into an accurate assessment of absolute cardiovascular risk. A distinguishing feature of guidelines from New Zealand[4] is that, by means of a risk table, they recommend explicit calculation of absolute cardiovascular risk in hypertensive patients. In a primary care setting, and without the use of decision aids, health professionals systematically underestimate absolute cardiovascular risk in hypertensive patients.[5]

It is possible that these estimates might be improved by the use of risk tables, but this presumes that health professionals will use such tables accurately. Within the context of a randomised controlled trial of computerised and card versions of the New Zealand risk tables that took place between 1996 and 1998,[6] the accuracy of health professionals in using the risk tables during patient consultations was investigated.

Method

Individual patient data were collected as part of a randomised controlled trial, which compared three groups of practices: those employing the risk table in card form only, the card plus a computerised version, and control practices delivering usual care.[6] All 96 practices in Avon using the EMIS or AAH Meditel computing systems were invited to participate in the study and 27 agreed to do so. Thirty patients with a diagnosis of hypertension and a record of having been prescribed antihypertensive medication in the previous year were randomly sampled from each practice list. Patients had their blood pressure measured and absolute cardiovascular risk assessed at baseline, six months, and 12 months follow-up by either their general practitioner (GP) or practice nurse, depending on management procedures within each practice.

The following patient information is required to ascertain absolute cardiovascular risk from the risk tables: sex, age, diabetes, smoking, blood pressure, cholesterol, body mass index, symptomatic cardiovascular disease, family history of ischaemic heart disease, and familial hypercholesterolaemia. Health professionals in the study were given training in the use of the risk tables by one of the authors (AM). For all risk estimates made both by health professionals and the 'gold standard', missing data were taken as having the lowest value in terms of cardiovascular risk. Measurements were missing largely in terms of cholesterol; this assumption had little impact either on the cardiovascular risk estimates or on the principal trial results where alternative assumptions could be explored.[6]

The risk tables classify patients into one of six absolute cardiovascular risk categories: <2.5%, 2.5 to 4.9, 5.0 to 9.9, 10.0 to 14.9, 15.0 to 19.9, ≥20% over five years. The guidelines recommend treatment if absolute cardiovascular risk is at least 10% over five years. Absolute risk category was recorded by health professionals in patients' notes as part of usual clinical care. The data presented here are for patients in the 10 practices randomised to the card only version of the New Zealand risk tables. (The six-month data are not presented here, but gave virtually identical results to the later follow-up.)

A computer-generated 'gold standard' risk classification was obtained by applying the New Zealand risk tables directly to the clinical data collected for patients in the trial. Sensitivity, specificity, positive and negative predictive values, and the crude misclassification percentage were calculated for the health professionals' ability to identify high risk patients, using the recommended 10% cut-off point for absolute cardiovascular risk, both at baseline and 12 months. In addition, the chance-corrected agreement between health professionals' assessment and 'gold standard' absolute risk was calculated using unweighted and weighted kappas (κ). In the latter, differences between the assessments of either one or two risk categories represent partial agreement (contributing fractionally to the weighted kappa), whereas differences of three or more categories are taken as fully discordant (Table 1).

Results

Baseline data were collected from 228 patients and 12-month follow-up data from 199 (87%) patients. A total of 34 GPs assessed absolute risk in approximately 80% of patients at each time point; the remaining 20% of patients were assessed by a total of five practice nurses.

Overall sensitivity and specificity of the health professionals' cardiovascular risk assessments were 82% (133/163) and 65%

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Table 1. Unweighted and weighted[a] kappa statistics[b] for agreement between 'gold standard' cardiovascular risk and health professionals' assessments of absolute risk using risk tables.

	Baseline		12 months	
	Unweighted	Weighted	Unweighted	Weighted
GPs	0.23	0.46	0.22	0.47
Nurses	0.39	0.60	0.40	0.60
Overall	0.26	0.49	0.30	0.56

[a]Weightings: correct = 1.0, discrepant by one risk category = 0.8, discrepant by two risk categories = 0.5, discrepant by three or more risk categories = 0.0. [b]Interpretation of kappas: poor≤0.20, fair = 0.21–0.40, moderate = 0.41–0.60, good = 0.61–0.80, very good = 0.81–1.00.

(42/65) at baseline, and 83% (128/154) and 73% (33/45) at 12 months. Given observed proportions of 71% and 77% of patients having cardiovascular risk of 10% or more according to the 'gold standard' at the two time points respectively, the positive and negative predictive values were 85% (133/156) and 58% (42/72) at baseline, and 91% (128/140) and 56% (33/59) at 12 months. The crude misclassification percentage was 23% at baseline and 19% at 12 months.

Correcting for chance, overall agreement between health professionals' assessments of absolute risk and 'gold standard' risk was moderate (weighted $\kappa = 0.49$ and 0.56); furthermore, nurses used the risk tables more accurately than GPs (Table 1).

Discussion

Use of risk-based tables is becoming increasingly common in the management of cardiovascular disease.[4,7,8] Although the value of these risk tables is dependent on their clarity and ease of use in routine patient consultations, health professionals' accuracy in using these risk tables has not previously been reported.

This study demonstrates that health professionals do not use the New Zealand risk tables accurately in clinical practice. Given that the health professionals involved were from self-selected practices participating in a randomised controlled trial, levels of agreement are, if anything, likely to be even lower in the wider population of practising clinicians. Whether health professionals would be more accurate in their use of other risk tables requires further research, although their similar structure leads us to speculate that the findings would be similar to those presented here.

Although the weighted kappa statistics are higher than the unweighted versions (reflecting the fact that misclassification tends to be by just one risk category), at best they still indicate moderate agreement. Furthermore, both groups' use of these risk tables improved very little over time. Inaccurate use of cardiovascular risk tables may be a further barrier to effective implementation of research evidence in the management of hypertension,[9] and studies are required into methods that optimise their use.

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