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Patients' concepts of hypertension

New insights show need for more shared decision making independent of cultural background

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The improvement in medical care through educational interventions is a complex undertaking and requires a thorough exploration of existing beliefs and attitudes. It has been assumed that concepts of disease are closely related to the prevailing local medicosocial context of doctors and patients, and that therefore they differ between different ethnic and cultural groups. In the linked systematic review of qualitative research on lay perspectives on hypertension, Marshall and colleagues challenge this widely accepted view.[1]

Smaller studies have shown some unexpected similarities between ethnic groups in their views and expectations about medical conditions.[2] However, this review shows a remarkable consistency in patients' attitudes and beliefs about hypertension among different ethnic groups in Africa, Asia, Europe, and North and South America.

When looking for a possible explanation of this consistency we have to take into account the fact that hypertension is a relatively new disease introduced by Western practitioners. The association between blood pressure values and cardiovascular events was made only in the middle of the last century,[3] and hypertension emerged as a concept. Nowadays we define hypertension as a valid measured blood pressure above a somewhat arbitrary level.[4]

Marshall and colleagues show that this physician defined condition of hypertension at best only partly matches the lay perspective, and that this is true throughout the world. Some of the lay beliefs may at first seem to be non-rational, but a closer looks shows a different picture. In the qualitative studies analysed by Marshall and colleagues patients commonly connected symptoms with hypertension. This seems to be illogical because doctors know that hypertension is asymptomatic except in severe cases. But patients expect to have symptoms to feel that they have a real disease. Patients also strongly associated stress and worries with hypertension, which is in marked contrast to the biological emphasis of most research on hypertension.

PAULA SOLLOWAY/ALAMY

Jointly find the best intervention for the patient

Nevertheless, evidence does exist that stress and psychosocial problems are related to overall morbidity from cardiovascular disease.[5]

In many of the studies in this systematic review patients reported deliberately modifying their drugs. This could be interpreted as non-adherence or as patients wishing to participate actively in their care and related decisions. Is the medical profession responding adequately to this?

Earlier research has provided insights into the barriers to implementing optimal treatment for hypertension, such as doctors' concerns about costs and workload and worries about medicalisation and patients' adherence.[6 7] But the fact that doctors' concept of hypertension as a disease does not match their patients' perspective is another major barrier. Reluctance to accept patients as active partners in decision making might also play a role.

The evidence that shared decision making can improve patient outcomes is growing.[8] So if we agree that matching medical and lay perspectives might give the best results in medical care we probably need to focus more on our own "professional" concepts.[9] Not only patients but also doctors should rethink their concepts of disease. For hypertension such rethinking may even include abandoning "target" values.[10 11] If the aim is to prevent cardiovascular disease we may be more effective if we emphasise the relevant outcomes rather than the surrogate measures. Doctors should help patients to understand exactly what they get from preventive interventions: changes in prognosis; changes in quality of life; but, in the case of drugs, also side effects.

In many areas of medicine such information may be difficult to obtain because of gaps in the evidence. In the prevention of cardiovascular disease, however, plenty of evidence is available. We can provide precise estimates of how much drugs and changes in lifestyle can reduce relative risk and absolute risk. The challenge is to communicate them in a language that can easily be understood and to jointly find an intervention that suits the patient. This is what shared decision making is all about.[12]

Marshall and colleagues' study could also help us rethink our research priorities. A closer study of what patients and practitioners think and really do can perhaps produce more useful information than the search for the molecular holy grail. Of course, both avenues should be taken, but the study of lay explanatory models and everyday behaviour deserves more study, because effectiveness depends so much on patients following preventive measures (whether lifestyle changes or adherence to drugs).

The finding in this study that concepts of disease may be less culturally dependent than had been thought—and therefore more generally applicable—may help in the future design of educational interventions. These should be much more related to patients' perspectives and to the outcomes that patients think are relevant than they used to be.

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RESEARCH, p 14

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Paracetamol plus ibuprofen for the treatment of fever in children (PITCH): randomised controlled trial (*BMJ* 2008;337:a1302)

Paracetamol plus ibuprofen for the treatment of fever in children (PITCH): economic evaluation of a randomised controlled trial (*BMJ* 2008;337:a1490)

Assessing respiratory rate for children with fever

Assessing both rate and temperature improves diagnosis of serious infections

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Every paediatrician and parent recognises the association between fever and rapid respiration rate in children, yet most criteria for judging whether a child is tachypnoeic fail to take temperature into account. In the linked article, Nijman and colleagues describe respiratory rate reference values that have been adjusted for both temperature and age. Such reference values have the potential to identify lower respiratory tract infection more accurately than traditional ones.[1]

Respiratory rate: only moderately sensitive for diagnosing serious infection

The World Health Organization recently published data showing that pneumonia was the principal infectious cause of death globally in children under the age of 5 years.[2] However, accurate diagnosis can pose a challenge because many children present with respiratory symptoms or acute febrile illness in the absence of identifiable lower respiratory tract infection. One of the most fundamental aspects of assessing a sick child is the measurement of vital signs, but interpreting the findings in the context of a dynamic illness is not straightforward.

Respiratory rates greater than absolute threshold values have been incorporated into many acute care guidelines such as the guideline on feverish illness in children from the UK National Institute for Health and Clinical Excellence (NICE),[3] the Advanced Paediatric Life Support (APLS) guidance,[4] and the WHO Integrated Management of Childhood Illnesses (IMCI).[5] These respiratory rate threshold values have generally been derived from expert opinion or measurements made in developing countries,[6] and they serve as screening tools for identifying serious illness, such as lower respiratory tract infection. They offer a simple and easily memorised approach but consider respiratory rate as a separate entity from temperature.

Nijman and colleagues have convincingly shown that temperature has a modest yet clinically significant effect on the respiratory rate of children. Their new temperature dependent respiratory rate reference values provide a more comprehensive version of what constitutes normal and abnormal respiratory rates. The results are potentially a great resource for future research, but application in clinical practice may be limited. The relation between temperature and respiratory rate is not linear so a simple or memorable rule for use in clinical decision making is not possible. The authors acknowledge this and suggest that a computer program or smart phone application could be created to apply such a complex dataset to everyday practice. Interest in developing computerised clinical decision support systems is certainly increasing, but such software will be successful only if it is widely available and easily integrated into clinical practice.[7]

Strategies to strengthen diagnostic certainty are extremely welcome, but there is an inevitable trade-off between a test's specificity and its sensitivity. The centile charts produced by Nijman and colleagues are clearly better than other published methods for discriminating between the presence or absence of lower respiratory tract infection on the basis of respiratory rate. Increased specificity will enable clinicians to rule in the diagnosis with more confidence. However, the test should not be used to rule out lower respiratory tract infection, or any other serious infectious disease, because it lacks sufficient sensitivity. Current APLS, NICE, and IMCI threshold values for respiratory rate are only of moderate sensitivity, and many children with serious infection will not be identified using these respiratory rate threshold values alone. We know that a large number of children with serious bacterial illness are sent home at first consultation, and the consequences of a delayed or missed diagnosis can be severe and occasionally fatal.[8]

Interpreting vital signs in the context of a dynamic illness is not straightforward

The findings of this study therefore support the need for a thorough assessment of a sick child. Respiratory rate must be part of a full evaluation, which incorporates other important signs and symptoms and, where available, the clinical judgment of an experienced doctor. The study was carried out in secondary care settings in resource rich countries, where doctors have ready access to radiography and laboratory tests and probably use vital signs as part of their initial screening, rather than to confirm the diagnosis. Nevertheless, the reported improved performance in ruling on the disease could reduce unnecessary investigations, particularly in the context of community acquired pneumonia.

The ultimate clinical value of Nijman and colleagues' work may be to improve the diagnosis of lower respiratory tract infection in resource poor settings, where the mortality is high and vital signs at presentation are often the only available indicators of serious illness.[2] In these settings a healthcare worker with only a basic level of training will often perform the clinical assessment. Access to investigations such as oxygen saturation monitoring, chest radiography, and blood tests may be limited. Temperature dependent respiratory rate centile charts could therefore have the biggest effect in this population. As the authors acknowledge, the external validity of these tests needs to be established, and the feasibility of incorporating the data into routine practice remains a problem. However, research into the applicability of improved methods of diagnosing lower respiratory tract infection is worth while, particularly in populations in which reliance on clinical observations is great and the burden of disease is high.

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RESEARCH, p 15

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- Communicating risk (*BMJ* 2012;344:e3996)

doc2doc
- doc2doc forum discussion: Has 'short' term risk prediction had its day? http://bit.ly/M5wFkb

The risks in risk prediction

QRISK is an improvement in risk estimation for UK practitioners, but caveats remain

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Comprehensive assessment of the risk of cardiovascular disease using a multiple risk factor system is now widely accepted as the method of choice for targeting interventions in primary prevention. However, several risk equations are available, and there is no consensus on which system or score to use.[1] In the linked paper,[2] a risk estimation system (QRISK2-2011), which was derived from the UK QRESEARCH database, is examined in an independent UK population to assess its predictive ability. Such external validation studies are necessary in the development of risk estimation systems to prove the accuracy and generalisability of such systems.

This important study shows that QRISK2-2011 has both better calibration (the degree to which the number of events predicted by the risk estimation system agrees with the number of events observed) and better discrimination (a measure of how correctly the system ranks risk between individuals) than the National Institute for Health and Clinical Excellence (NICE) version of the Framingham equation. The NICE Framingham equation is based on the 1991 Anderson Framingham equation, which is known to overpredict disease levels in some populations.[1 3] Comparisons of the relative validity of different risk estimation tools are often undertaken and can be susceptible to bias.[4] Collins and Altman, however, provide a statistically rigorous comparison, and their findings represent an advance in risk prediction for practitioners based in the United Kingdom.

Nonetheless some caveats remain. Both the derivation and validation of risk estimation tools bring substantial methodological challenges. Here, the QRISK validation has been performed in the THIN (the Health Improvement Network) dataset. Traditional cohort studies are expensive and take many years to perform, whereas THIN represents a new type of epidemiological data collection. In THIN, general practice software gathers clinical data to populate a database that can be used for statistics and research. The benefits

of such a process are easily appreciated, and the sample size available in THIN is considerable. However, unlike traditional cohort studies, definitions used for the clinical endpoints may vary in such datasets, and although studies of data validity in THIN have been performed,[5] these have been less stringent than the case validation procedures undertaken in cohort studies. In addition, there are many missing data in THIN, which the authors deal with by using multiple imputation methods. However, cholesterol concentrations were not known for 78% of patients in THIN, and this reduces the face validity of the risk estimate. Given that statins are so widely used to reduce risk of cardiovascular disease, knowledge of an individual patient's lipid concentrations would be essential. The generalisability of QRISK to non-UK populations also remains to be shown.

Model parsimony is the concept that risk estimation models and scores should achieve an optimum balance between attaining the best risk estimate and providing a simple and concise score for clinical use. A risk score that has multiple data items, or items that are difficult to collect, is less attractive to busy doctors.[1 6] QRISK2-2011 requires the clinician to ascertain 13 different clinic variables, compared with the seven variables in the NICE Framingham equation.[2] It may be that a more pared down version of QRISK might attain similar validity results and be easier to apply in clinical practice. Notably, from this external validation, it does not seem that the 2011 version of QRISK is substantially more effective that the 2008 version. Clinicians may call for the inclusion of further risk factors such as diet or physical exercise variables, but previous work on the INTERHEART modifiable risk score has shown that inclusion of further, less powerful, risk predictors does not necessarily improve score discrimination.[7] A strong statistical association needs to exist between a risk factor and a disease for that factor to contribute as part of a screening test.[8]

Collins and Altman show the effects of the QRISK and Framingham tools at different thresholds of risk, thus illustrating perfectly one of the challenges of risk estimation: what level of risk uncertainty can we tolerate, and at what point do we deem that CVD risk become "too high"? From table 4,[2] it can be clearly seen that if we choose an arbitrary risk cut-off point in QRISK2-2011 of 15% or more, we will be instituting preventive treatment in more than 10% of women and almost 20% of men in this primary prevention group. Do we err on the side of expanding the population eligible for treatment, such as described by the Cholesterol Treatment Trialists,[9] and if so, what are the pharmacoeconomic implications of the potential onslaught of prescribing? Furthermore, the "real world" use of risk estimation tools in primary prevention care is not known. Some doctors may think that they can estimate risk without recourse to a scoring system,[10] and there is evidence that prescribing in primary prevention may be more *ad hoc* than evidence based.[11]

Thus risk estimation remains an imperfect science. It may be that using existing tools in an open consultation with our patients will lead to better risk factor modification. Concepts such as risk age, explored in tools such as SCORE[12] and QRISK2-2012 (http://qrisk.org/), provide a more tangible description of risk for patients, as do features such as showing patients the relative contributions of adverse risk factors to their personal risk profile. QRISK represents an improvement in risk estimation for UK practitioners, but its generalisability to other populations is unclear and the problem remains as to what represents an "acceptable" versus "unacceptable" risk level.

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Multimorbidity and the inverse care law in primary care

Inequalities set to rise as criteria for funding change in the UK

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Multimorbidity, usually defined as the coexistence of two or more long term conditions within an individual, is rapidly becoming the norm among people with chronic disease. Although often seen as a problem of elderly people, it affects large numbers of younger people too. Multimorbidity is not simply a problem of chronological ageing, but neither is it randomly distributed.[1] In a recent Scottish study of almost 1.8 million people, more people with multimorbidity were aged below 65 years than above,[2] and similar findings have been reported outside the United Kingdom.[3] The level of deprivation influences not just the amount but also the type of multimorbidity that people experience. Multimorbidity is more common and occurs 10-15 years earlier in the most deprived areas than in the most affluent ones.[2 4] A greater mix of mental and physical problems is seen as deprivation increases, which means increased clinical complexity and the need for holistic person centred care.[2 5]

What then are the implications of high burdens of multimorbidity for health and healthcare in deprived areas? The inverse care law, which observes that: the availability of good medical care tends to vary inversely with the need for it in the population served, and which "operates most completely where medical care is most exposed to market forces and less so where such exposure is reduced,"[6] remains the key factor. Inequities in the distribution of general practitioners are especially prominent in market based healthcare systems,[7] but even in the UK, with its tradition of universal coverage through the NHS,

SCUNNY/ALAMY

Deprived areas see younger patients with multimorbidity

the distribution of general practitioners is based on local population size rather than on need.[8 9]

More multimorbidity in deprived areas means that patients die younger, are sicker for longer before they die, and that they (and their families) present more complex problems to general practitioners and primary care teams. Primary care in these areas is in turn relatively understaffed, under-resourced, and less able to deal with patients' needs than in more affluent areas. Secondary care manages emergencies, but emergency services are a poor and inefficient substitute for the personalised integrated primary care that patients with multimorbidity need.

The inverse care law directly affects the clinical encounter and the doctor-patient relationship. Compared with their counterparts in more affluent areas, patients in deprived areas with complex problems feel less enabled and their doctors feel more stressed after consultations.[5] The key deficit is time.[9 10] Too little consultation time is the mechanism that—within the complex context that shapes encounters between patients and doctors living and working in deprived areas—reduces patients' expectations and what doctors can deliver.[11] Perversely, neither the inverse care law, nor its principal mechanism, shortage of time, are mentioned in most high level reports on health inequalities.

Healthcare itself becomes a social determinant of health when it falls short of meeting the needs of the sickest patients. Current and planned changes in primary care in the NHS in England herald a worsening of the manifestations of the inverse care law by distributing resources solely on the basis of age. Such a change effectively takes money away from practices in deprived areas, where fewer people survive into old age but younger patients have a higher burden of disease.[12]

The inverse care law is not a natural law but the result of policies that restrict access to effective needs based care. It mainly affects patients of low socioeconomic status with multimorbidity, who have a mix of physical, psychological, and social problems, and consequently need time, empathy, and a holistic patient centred approach to care. The law therefore results in healthcare underachieving in poor areas. For healthcare services to narrow rather than widen inequalities in health, they need to be at their best when meeting the challenge of caring for patients with multimorbidity in deprived areas. For this to occur, the allocation of resources will need to match the greater needs of deprived populations at younger ages, rather than resources being distributed on the basis of age.

This is the second in a short series of editorials on multimorbidity.

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Corrections and clarifications

Aristolochic acid nephropathy

We inadvertently used an incorrect image in this Editorial (*BMJ* 2012;344:e4000, print publication 14 Jul, p 9). We thought we were showing *Aristolochia clematitis* as this was how the plant was described by Science Photo Library, which supplied the image. Science Photo Library has since confirmed to us that its supplied image was not of *A clematitis*. The real *A clematitis* is shown right.