SPECIAL REPORT

General health checks are not beneficial for general adult population

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Whether physicians should ask their patients to attend for a regular review of their health status not motivated by any particular problem has been a long-standing issue in primary care. A Google search for "regular health check-ups" yielded 4 810 000 000 hits in less than 1 second. Scanning the first couple of pages, most of the advice and comments suggest such health checks are a good idea; indeed, most are enthusiastic advocates.

The question then arises: What is the evidence supporting the utility of such health checks? Krogsbøll et al[1] published a systematic review addressing the impact of general health checks in adults on morbidity and mortality—an update, with the addition of 1 trial, of their 2012 review—that included 17 trials; 15 that reported relevant outcomes included over 250 000 participants. Their conclusion: General health checks have little or no effect on the mortality from any causes, cancer, and cardiovascular disease with high- to moderate-certainty evidence.

This is the most comprehensive systematic review available, and the authors adhered to high standards of rigor and robust methodology. Limitations of the review include that the studies were all done long ago—indeed, the most recent trial was initiated in 1999. Moreover, the intervention offered varied a great deal among trials. Yet, this has its advantages in that if results are consistent, it enhances applicability, and if they are different, it may allow for an exploration of reasons for the differences. The length of follow-up was impressive: the median for total mortality was 10 years and ranged from 4 to 30 years. This was also true for other outcomes.

The studies in this review included screening for more than 1 disease or risk factor and in more than 1 organ system, whether performed only once or repeatedly as "general health checks." The screening interventions under this definition differed considerably among trials. For example, 6 trials included a physical examination by a physician, while 9 trials did not; 5 trials included screening for cancer, 10 did not. This wide range of interventions and heterogeneity among trials challenges the interpretation of the effects of screening and makes a reference to other evidence—as we shall describe—mandatory for an appropriate conclusion.

What is the best outcome for assessing the effect of a screening intervention? Some systematic reviews and trials considered surrogate outcomes as important, and therefore concluded that general health checks were beneficial in their influence on total cholesterol levels, blood pressure, body mass index, or delivery of recommended preventive services.[2,3]

Researchers used surrogate outcomes to assess the effect of a screening intervention because investigating patient-important outcomes requires long follow-up. Such long follow-up may involve changes in healthcare practices including the type of diagnostic tools, accuracy of the exam, and evolution of treatment methods.

Although surrogate outcomes are appealing because of the advantages in terms of feasibility and avoiding changes over time, they are very often misleading: a plethora of trials have been positive with respect to surrogates, only to be followed by trials demonstrating no effect, or indeed harm, on patient-important outcomes.[4] Therefore, in almost every situation, only patient-important outcomes provide compelling evidence of the impact of screening on health effects that would motivate patients to undergo an intervention with associated risk, cost, or inconvenience.

As well as benefit, health checks can lead to harm as a result of adverse psychological effects, complications due to follow-up investigations, and unnecessary treatment due to overdiagnosis. The trials addressed these possible harmful outcomes only to a very limited extent. For example, only 1 trial reported the number of new diagnoses; 1 trial reported referrals to specialists; and no

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trials reported additional diagnostic procedures required due to positive screening tests, the total number of prescriptions, new drugs prescribed, or the number of operations performed. This neglect of adverse outcomes is far from unique: cancer screening trials seldom quantify the harms of screening.[5] The lack of information regarding harms limits inferences, but it is nevertheless worth bearing in mind when considering recommendations for action.

There are a number of interventions for which there is moderate- or high-quality evidence for screening in reducing morbidity and disease--specific mortality. These include hypertension[6] as well as cervical,[7] breast,[8] and colon cancer screening.[9] Some of the periodic health check trials did encompass these clearly beneficial screening interventions. Although nearly all trials included blood pressure measurement, most did not include periodic measurement during the follow-up period. Mammography was included only in 2 trials, while only single trials encompassed cervical smear, sigmoidoscopy, and fecal occult blood test.

There are many possible reasons why the health check-up trials failed to demonstrate an impact on patient-important outcomes. First, few trials delivered the interventions that, in trials devoted to specific screening procedures, have proved to influence patient-important outcomes. Some included trials offered only a physical examination by a physician or brief lifestyle advice, while only the latest 3 trials embraced risk score assessment for cardiovascular disease. We now know that primary prevention with aspirin does not impact mortality, and though it reduces myocardial infarction, it increases bleeding. Statins were not in wide use at the time the studies were undertaken.

Second, even the effective screening interventions have failed to show an impact on all-cause mortality. Indeed, for some of the screening interventions with demonstrated benefit, the magnitude of that benefit is extremely small. This is true for breast cancer screening, which is a value- and preference-sensitive screening test (that is, given the very small benefits and substantial harms, many informed women are likely to decline screening). It is also true for colon cancer screening, in which a recent guideline suggests that many informed individuals at low risk are likely to decline screening.[10]

Third, it is possible that the individuals most likely to benefit were excluded from the trials. Physicians may have assessed the risk of cardiovascular disease or other diseases in their patients and failed to include those high-risk individuals. If so, people who could potentially benefit from general health checks may be excluded. Some support for this hypothesis comes from the findings of the systematic review, which showed that health checks failed to increase admission rates, number of people admitted once or more, or number of days in the hospital.

Further support for the hypothesis comes from knowledge that some trials randomized only people who had returned an initial questionnaire on health and lifestyle. Moreover, the most recent trial, Inter99, reported that participants were healthier than nonparticipants at baseline. The trial reported lower mortality among participants than nonparticipants, but since there was no effect of the intervention when compared with control patients from randomized trials, the difference is due to self-selection according to sociodemographic and health characteristics.[11]

Fourth, the elements of the general health checks, such as blood pressure measurement, consultation for smoking cessation, might have been offered to the control group—a condition we call "contamination."[12] If a screening test is simple, inexpensive, and acceptable, contamination can occur frequently. Indeed, the general health check, in some countries, is a routine part of medical practice and has been so for many years.[13,14] Therefore, a control group may undergo health checks outside the trial. To the extent it does occur, it will be less likely that randomization to a health check shows an effect on mortality or morbidity. The review concluded that 4 trials were at high risk of contamination, 7 were at low risk of contamination, and 6 trials were unclear.

Despite its limitations, the evidence synthesized by Krogsbøll et al[1] represents the best available one for addressing the impact of general health checks on patient-important outcomes. Given the lack of favorable evidence and the potential adverse effect, primary care providers should consider the fact that general health checks, beyond the screening interventions shown to have benefit, likely have little or no effect on important health outcomes. Some of the interventions with demonstrated benefit have sufficiently large effects that a uniform application is warranted (blood pressure measurement and cervical cytology screening). In others, the trade-off between benefits and harms is so close that patients should be involved in fully shared decision making regarding their participation (breast and colon cancer screening).

In conclusion, clinicians should look to guidelines regarding screening, implement interventions shown to be effective (including shared decision making in those interventions in which benefits are very small and harms and burdens appreciable), and refrain from conducting health checks with elements beyond these limited interventions.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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