

Danish GPs' perception of disease risk and benefit of prevention

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Background. Uncertainty and risk are central issues in relation to health and health care services. Healthy individuals do not necessarily fall ill, despite the presence of risk factors. It has been documented that doctors, health service administrators and patients are more inclined to choose interventions against risk factors when information about the effects is presented in terms of relative risk reductions rather than absolute risk reductions.

Objectives. The objective of the study was to gain better insight into how GPs perceive risk of disease, and how this perception is influenced by the way the risk is presented, e.g. whether changes in risk are presented in absolute or relative terms.

Methods. Questionnaires with clinical episodes were sent to 1500 Danish GPs. The GPs were randomized into four groups of 375, who all received the same case story with information about risk reduction achieved through medical treatment phrased in terms of either relative risk reduction, absolute risk reduction, number needed to treat or all of the aforementioned terms of risk reduction. The GPs were asked whether they would recommend medical treatment as primary prevention, knowing the case story and expected risk reduction.

Results. The GPs' attitude towards recommending medical treatment was dependent on the phrasing of risk reductions. Seventy-two per cent of doctors who received all information on risk reductions would definitely or probably recommend medication, while 91% would recommend medication if information only about relative risk reduction was given, and 63% would recommend medication if information was given in terms of absolute risk reduction or number needed to treat.

Conclusion. In order to advise patients in a rational way, in addition to knowledge of the patients' preferences, doctors need to take into account all available measures of risk reductions.

Keywords. General practice, number needed to treat, risk-reducing.

Introduction

Uncertainty and risk are central issues in relation to health and health care services. Healthy individuals do not necessarily fall ill, despite the presence of risk factors. When symptoms do occur, the diagnosis might still be uncertain. When a treatment is chosen, the effectiveness is not known for certain. The uncertainty presents a difficult choice for both patients and doctors. On the one hand, one wishes to prevent potential disease and injury, while on the other hand one wishes to avoid morbidity of the population and thus overloading the

health care system. Better knowledge of patients' and doctors' perception and understanding of risk is therefore necessary, in order both to avoid unnecessary anxiety and to be able to utilize the limited resources of society to the optimum. As the doctor is presumed to be better informed than the patient, the patient is, so to speak, in the doctor's hands with regard to choosing the type of health care. It is therefore particularly important to know and understand GPs' perception of risk in relation to guidance and treatment aimed at prevention of disease.

The problem of differences in perception of risk is well known within the field of clinical medicine. The effect of prevention through intervention against risk factors can be measured as absolute risk reduction (ARR) or the inverse, which represents the number of people needed to be treated for each case averted (number needed to treat; NNT). Alternatively, the effect can be expressed as relative risk reduction (RRR), number of disease cases

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averted among the population or in mean lifespan. It has been documented that doctors,¹⁻⁴ health service administrators⁵ and patients⁶ are more inclined to choose interventions against risk factors when information about the effects is presented in terms of RRR rather than ARR. Many have argued in favour of the effects being presented as NNT.⁷⁻¹⁰ There is, however, surprisingly little evidence that patients or doctors make more appropriate decisions when NNT is preferred to other measures of benefit. By appropriate decisions, we mean decisions that are in accordance with those made by patients or doctors given all available information.

Doctors' advice on prevention ideally should be evidence based and individualized, i.e. based on a total assessment of risks and patient resources.¹¹ Despite the doctor's core role in prevention, there is, however, limited knowledge about the factors influencing the doctor's advice. It has, for instance, not been examined to what extent the doctor's perception of risk and subsequent advice to patients are influenced by tradition or by estimates of relative and absolute risk, respectively. The objective of the study was to gain better insight into how GPs perceive risk of disease, and how this perception is influenced by the way the risk is presented, e.g. whether changes in risk are presented in absolute or relative terms.

Methods

Questionnaires with clinical episodes were sent to 1500 GP practitioners randomly drawn from the membership list of 3396 active members of the Danish General Practitioners' Organization. The 1500 GPs were randomized into four groups of 375 who all received the same case story (Box 1) but different amounts of information about risk reduction. The first group only received the NNT information: "The drug must be used by 100 persons, in order to prevent one death from the disease after 5 years." The second group only received the RRR information: "The drug reduces the risk of death from the disease by 50% after 5 years." The third group received the ARR information: "Treatment of 1000 persons will result in 990 avoiding death from the disease after 5 years, compared with 980 if untreated." The last group received all risk information (ARR, NNT and

Box 1 Case story

Imagine a disease afflicting more than 20% of individuals over 40 years old. The disease in itself produces no symptoms, but predisposes to early death. A well-tested approved drug is available on the market, which could prevent premature death. Lifelong treatment with this drug must be expected, but the treatment has no significant known side effects.

The drug is expensive, but still affordable for the patient.

RRR). It should be noted that the group of doctors who were given the ARR information, in contrast to the other groups, were informed about the baseline risk for the disease in question and that the RRR with some effort could be calculated from the ARR information. The group who only received the NNT information was also asked in what way they understood the information about risk reduction, i.e. whether they found that "most patients would not benefit from taking this drug because only 1 in 100 avoids premature death" or that "most patients would benefit to some degree from taking this drug although only 1 in 100 avoids premature death".

The GPs were asked whether or not they would recommend the drug to their patients over 40 years of age, who have the disease, knowing that the drug is expensive, but still affordable. The questionnaire also contained questions on demographic variables of the GPs. Differences between the randomized groups were tested by chi-square tests (statistical significance level 5%), and 95% confidence intervals were calculated.

The questionnaire was completed and returned by 1127 GPs (75%) after one reminder. Respondents did not differ from non-respondents with regard to gender, age or type of practice (rural, city or mixed).

Results

Among GPs who received all information on risk reductions, 72% would definitely/probably recommend the drug. If information on only relative risk reduction was given, 91% would definitely/probably recommend the drug. If information only on absolute risk reduction was given, either as NNT or as ARR, only 63% would have a positive attitude towards recommending the drug (Table 1).

TABLE 1 Percentage of GPs who would definitely/probably recommend the drug versus those who would not as a function of the kind of risk information given

	All information <i>n</i> = 243	NNT <i>n</i> = 295	RRR <i>n</i> = 290	ARR <i>n</i> = 299
Definitely/probably	72% (67–78%)	62% (57–68%)	91% (87–94%)	63% (57–68%)
Probably not/definitely not	28% (22–33%)	38% (32–44%)	9% (6–13%)	37% (32–43%)
Reply rate	65% (60–70%)	79% (75–82%)	77% (73–82%)	78% (76–84%)

95% confidence intervals are given in parentheses.

Differences in attitudes towards recommending the drug among GPs who received all information on risk reductions versus those who received information only on RRR or only on ARR were highly significant ($P < 0.001$ and $P = 0.02$, respectively). Whether ARR or the reciprocal value (NNT) was presented produced no significant difference ($P = 0.97$).

Among the GPs who received information on NNT only, 56% agreed that most patients would not benefit from taking the drug, while 44% believed that most patients would benefit to some degree, although only 1 in 100 would gain full benefit.

Discussion

Decision making under conditions of uncertainty is difficult. It is hard to believe that optimal decisions could be made on less than complete information. If risk reductions are given in only relative or absolute terms, decisions may be distorted. This study shows that doctors receiving only figures on ARR tend to be more reluctant in their recommendations of an intervention to reduce risk, compared with doctors given full information. Doctors given only data on RRR tend to be more ready to recommend the treatment. The question asking whether the NNT was understood disclosed that this information is ambiguous. The statements "most patients do not benefit from taking the drug because only 1 in 100 avoids premature death" and "most patients do benefit to some degree from taking the drug although only 1 in 100 avoids premature death" cannot both be true. When the effect of a treatment is like a lottery, e.g. DC conversion for ventricular fibrillation, the first statement may be true. In most instances, the last statement is probably true, as most people would agree with this when it comes to smoking cessation. Approximately 4000 40-year-olds smoking on a daily basis would have to quit smoking in order to avert one case of lung cancer in the next 10 years.¹² Thus, the NNT is 4000. This obviously does not mean that only one person would benefit from smoking cessation and 3999 would not. However, as a little more than half the doctors in this study thought, most probably incorrectly, that the probability of obtaining benefit was one out of the actual NNT, the use of NNT should be seriously questioned as a valid and usable sole measure of benefit that conveys all necessary information.

The finding that more doctors would recommend the drug when information on only RRR was given is in accordance with other studies.^{2,4,13,14} This may be because the RRR was large, and the ARR was small. It might be interesting to repeat the study, examining an intervention with a much larger ARR.

The overall response rate was 75%, which is a little more than expected in questionnaire surveys among GPs. On the other hand, the study was well recommended by

the Scientific Research Evaluation Committee under the Danish College of General Practitioners. However, significantly fewer ($P < 0.001$) doctors completed the questionnaire containing all information on risk reduction. This may be because this questionnaire contained more information, thus being slightly longer, or because the different pieces of information were perceived to be contradictory. No differences in demographic variables were found between the four groups. Significance of lack of response cannot be evaluated further.

Information on NNT nor RRR alone does not provide doctors with all the information needed in order to recommend treatment or prevention to their patients. The NNT does not seem to be advantageous compared with its reciprocal value ARR. In order to advise patients in a rational way, in addition to knowledge of the patients' preferences, doctors need to take into account all available measures of risk reductions. Studies examining patients' preferences and perceptions of risk are needed.

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