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Saturday May 31, 2003

Euroanaesthesia 2003 - Glasgow

ANAESTHESIA AND RISK

Although risk is part of life, there is the unspoken assumption that one of the aims of a civilised society is to make life as safe as possible for its citizens, and that risks should be kept to a minimum. As society is perceived to be ever safer, people are more reluctant to accept the risks that remain. Anaesthesia is perceived to be particularly risky, and may cause the surgical patient more anxiety than the operation itself. Risk in anaesthesia arises from the patient, anaesthetist, or the process of anaesthesia. The state of general anaesthesia is easily achieved but is characterised by uncertainty and unpredictability [1]. The mechanisms of anaesthesia, the mode of action of drugs and cause-and-effect relationships are poorly understood. The constantly-changing physiological status of the patient and the superimposed disturbances due to surgery create a potentially hazardous state for the patient. The process of anaesthesia is probably more akin to other complex technological systems such as the aviation industry than to other branches of medicine [2].

So anaesthesia is inherently risky. But what of the anaesthetist? The anaesthetist not only works in a complex environment but also works under enormous time pressures. Is there a particular personality type suited to this kind of work? David Gaba, an expert in human factors relating to anaesthesia has asserted that anaesthesia and intensive care attracts people who like 'living life on the edge': 'In all likelihood, the emphasis on direct action and the aura of "danger" lurking just below the surface are the key factors that attracted many anaesthetists to this line of medical work rather than others' [3]. How true this is I leave to readers to judge for themselves! However, the anaesthetist's behaviour under these pressures determines to a large extent the outcome of the anaesthetic and hence the risk of anaesthesia. As new drugs, new technology, new and varied surgical interventions and a wider age range of patients come together the challenges of risk management increases. Anaesthetists' attitudes to risk are one of the influences shaping their clinical behaviour and are worthy of attention.

RISK PERCEPTION: BACKGROUND

An individual's perception of risk depends on his/her psychological orientation, the characteristics of the risk and risk bias. Psychological orientation can be *risk seeking*, *risk averse* or *risk neutral*. Risk seekers seem to take large risks for relatively small benefit and the reverse is true for the risk averse. Characteristics of risk such as severity, controllability and timing, whether immediate or delayed, colours our view of risk. In general, people are more concerned about the more severe risks than the more frequent, but severity of risk is subjective and conditioned to the cultural background. Hence when discussing the severity of risk it is important to allow the patient to voice his view on the severity. People are more accepting of risks they feel they have some control over than of ones they feel forced into. (Consider the risk of contracting AIDS from promiscuous sexual behaviour as against blood transfusion, or whether exposure to cigarette smoke is active or passive). Timing relates to time of occurrence and also if the consequences are transient or long-lived. Complications occurring immediately have more impact and so do those which are permanent. These facts go some way towards explaining why anaesthesia is perceived to be inherently risky. Patients would often rather not be anaesthetised, but know they must be, and the state of general anaesthesia implies complete loss of control over oneself. The most severe complications such as hypoxic brain damage, are rare, but immediate and permanent.

This already complex state is further influenced by the operation of a number of biases [4]. When a particular risk is well publicised – for instance, the news reports of deaths under anaesthesia in dental surgeries – the probability of that happening is overestimated. This is called *availability bias*. For example, though car travel when compared to air travel is much more likely to result in a fatality over total distance travelled; air travel is perceived to be more risky because of the wide media coverage [5]. It has also been shown that rare risks are over estimated and the more common ones are underestimated. This is termed *compression bias* [6]. A related characteristic is *vulnerability*. Some people feel that they are more susceptible to risks in general, or a particular risk, than others. This may colour their judgement.

For instance, heavy smokers may acknowledge that smoking causes lung disease, but deny that it will happen to them, suggesting that they see themselves as invulnerable.

RISK COMMUNICATION: WHY AND HOW

Discussing risks is an essential part of informing patients about anaesthesia. In this, as in communication in general, current opinion suggests that, in principle, there is no such thing as ‘too much information’. Although we would nowadays accept that it would be unethical to make a clinical decision on a patient’s behalf, so it is inappropriate, in principle, for a doctor to decide how much information a patient should receive. Omitting to mention information keeps control in the hands of those who have the information, and this does not foster the spirit of partnership which patients expect from their doctors. In the United Kingdom, both the General Medical Council (the profession’s self-regulating body) and Government guidance on consent [7] have made it quite clear that full information is required. Where risks are concerned, clinicians should consider the two points:

- 1) *What are the risks?*
- 2) *If there are risks, are they minor or major?*

WAYS OF COMMUNICATING RISKS

WORDS

The simplest and most obvious way of expressing probabilities is using words. One potential problem is that, although we may think we know what we mean by a certain verbal expression of probability, someone else may interpret it differently. Beyth-Marom and colleagues [8] presented their subjects with a number of verbal expressions of probability, ranging from ‘not likely’ to ‘certain’ and asked them to assign a percentage value to each. Not surprisingly, there was good agreement as to the meaning of ‘certain’, with most people giving a value of between 98 and 100%. However, phrases such as ‘can’t rule out entirely’ and ‘There is a chance’ produced a range of results from 24 –49% and 37-60% respectively. However, when grading side effects and risks, it may be sufficient to group them into a small number of simple categories – for instance, common, unusual and rare. This allows some sense of the relative frequency of different complications whilst avoiding spurious precision.

NUMBERS AND VISUAL REPRESENTATIONS

Understanding of numerical concepts varies widely amongst the general population, and many doctors have difficulty with statistics. Nevertheless, most doctors would recognise the statistical fallacy of opinion poll surveys that show that 85% of the populace believe that they have a better than average sense of humour. Many patients, however, are disturbed to learn that 49% of doctors would show below average performance!

One alternative to using pure numbers is to use visual methods. A number were reviewed by Calman and Royston[9]. They included:

- a ‘risk stick’ one metre long (risks are thus represented by distances, a risk of 1 in 1000 corresponding to a distance of 1 km and so on)
- arrays of dots or cubes corresponding to the denominators for risks
- ‘community clusters’ - visualising how many people might live in a town , a city, or a region and so on , and using these as the denominator for risks.

A later review updates and expands on visual methods, with examples [10]

There is a body of opinion that that public discussion of risk would be much easier if there were one simple and widely understood scale on which any given risk could be placed and compared with others. These are often called ‘risk ladders’ and a number have been published. Ours is shown in the Figure.

FIGURE 1

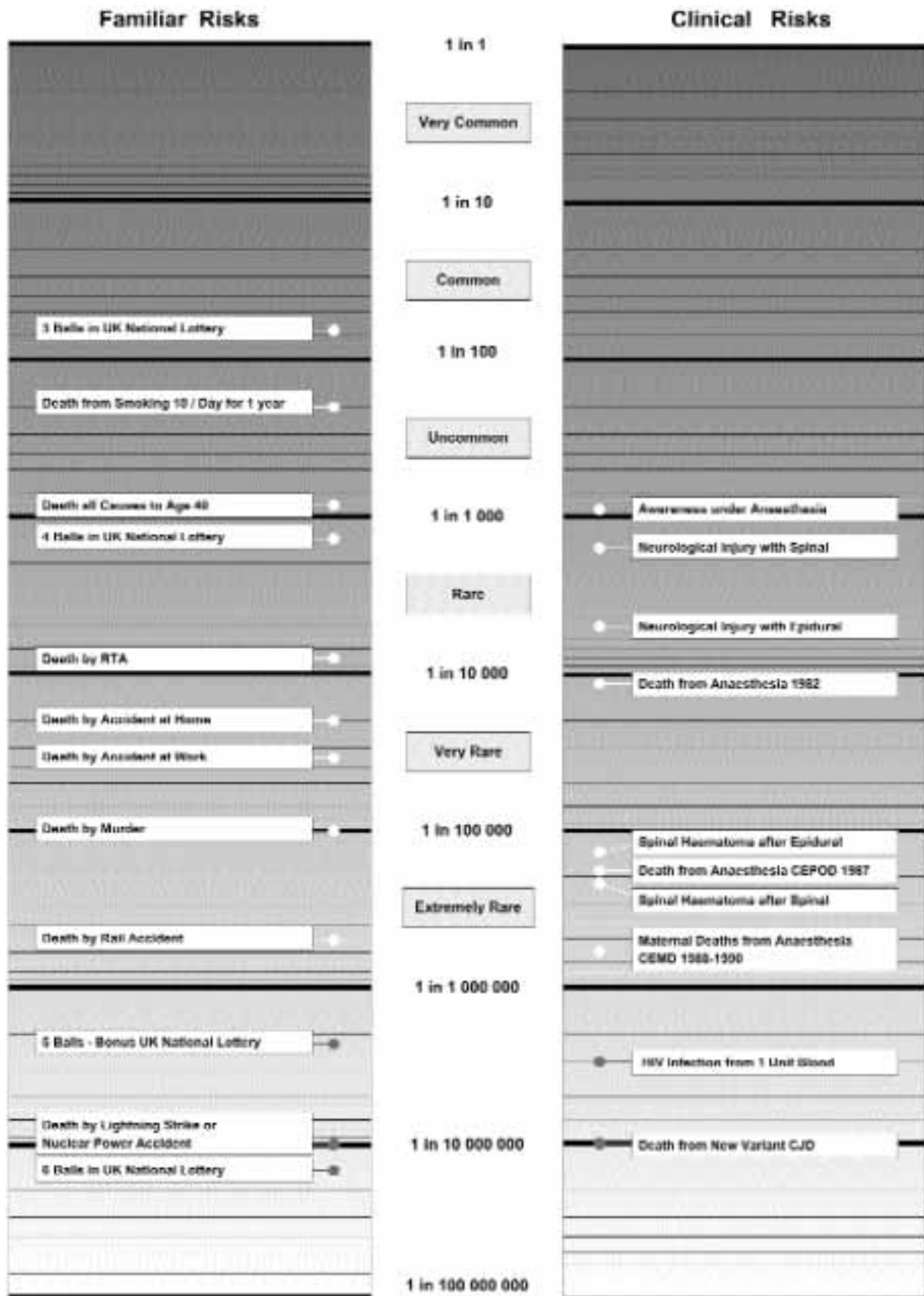


Figure 1: Risk ladder

These can be helpful in trying to get over the difficulties of conceptualising very small probabilities - logarithmic scales are usually used for this. Ladders can also be used to show comparisons between different types of risk - for instance, clinical and everyday risks - and so can correct misperceptions about risk. Providing a sense of perspective is one thing, but the danger is that comparing two risks is used to imply acceptability. People may happily accept numerically greater risks than the risks we might propose for them, but this does not mean they are irrational to refuse ours, as they have their own perceptions of what is going on. We accept certain risks every day and Paling makes use of this in his 'perspective scale'. He advocates establishing the risks of daily activities such as commuting to work, smoking or drinking alcohol as 'risk neutral' or acceptable and using these as comparators to gauge other risks [11].

PITFALLS IN RISK COMMUNICATION

EXPERT AND LAY PERSPECTIVES ON PROBABILITY

Doctors and their patients may approach the subject of risk in very different ways [12]. One could almost say that they form two distinct 'tribes' with two ways of looking at the world [13]. The sciences - including medical sciences - have adopted a statistical approach to the world about them. Their questions are, how far a given individual is representative of a larger population, and how significant is any variation that may result from sampling. Their patients, on the other hand, look at risk in a much more subjective, socially-constructed way. Think of the risk of post-dural puncture headache. An anaesthetist may quote an incidence of 1 in 100 spinal anaesthetics. So, on average, 1 in every 100 patients will experience this complication. But as far as each of these individuals is concerned, the risk is either zero or one. It is all or nothing. Doctors may try to answer that question by making direct inferences from group statistics to individual risks. However, this process makes two assumptions. First, that the individual is entirely representative of the population, and second, that the distribution of risk is truly random. Neither will be literally true. If the statistics can be broken down to show how a risk depends on age, sex, place of work, lifestyle and so on, the gap between the two perspectives narrows.

DEFICIENCIES OF DATA

A major difficulty in communicating risks is defining how likely they are to occur. Often published sources are old, or give a range of possible incidences which is so wide as to be unwieldy, or deal with risks which are rare and so harder to establish precise estimates for. A further problem is that denominators are not always specified. For instance, does a risk of death of 1 in 8 000 by road traffic accident mean one death per 8 000 miles travelled, or one death per 8 000 journeys? We have tried as part of the Royal College of Anaesthetists' Patient Information Project [14] to gather together recent figures for the side effects and risks of anaesthesia and these form an Anaesthesia Risk Resource on www.youranaesthetic.info. Again, too, these are population-based data and are less revealing about risks to a particular individual. Proper estimation of risk-benefit ratios is further compounded by the fact that, for many of our interventions - thoracic epidural anaesthesia for pain relief after laparotomy, for instance, it is often difficult to find good numerical estimates of benefit.

TRUST

The nature of the doctor-patient relationship is thrown into the sharpest focus when risk is discussed. Trust is one of the prerequisites for successful risk communication. This sounds self-evident, but no matter how perfect the message which risk experts wish to convey, if the recipients do not trust them, the communication is ineffective. An American expert on risk communication strategies has developed a hierarchical model showing how risk communication strategies evolve as organisations become more mature and clued-up in their approach [15]. He emphasises that discussion about risks can be simply a symptom of a deeper problem. 'People often get bogged down in controversies over risk when they have concerns over process, that is they are either mistrustful of the way that an organisation does its business, or because they feel they have been treated shabbily. They discover that whilst being disgruntled does not have legal standing, complaining about risks does. After some period of complaint and friction, the ensuing controversies can take on a life of their own.' [9]. Debates about risk then become surrogates for other concerns. We suggest that the current desire for risks of medical care to be 'brought out into the open' springs partly from concerns over the nature of the doctor-patient relationship in general. If this is so, then it is not sufficient simply to find and publicise our most accurate estimates of the risks of anaesthesia. The whole tone of our written information, or the way we conduct ourselves in person, communicate our beliefs and intentions over and above the factual content of the words or numbers we use. Notions of risk and safety are touched upon in every aspect of our contact with patients, and cannot be 'packed away' into a separate section of the information leaflet or one isolated part of the consultation [16].

ADDING AND TAILORING RISKS

When considering risks, it is important to distinguish between baseline risks (for instance, the baseline risk of natural death which we all carry, though it increases with age) and added risks, which are superimposed on this baseline risk. Smoking increases the likelihood of premature death, as do accidents and murder. So most of the risks on the risk ladder in the Figure are to be added to baseline risk, although adding rare risks to baseline risk clearly makes little difference to overall risk.

The 'baseline risk' of death due solely to anaesthetic causes is low (commonly given as 1 in 185 000 [17]). Death after surgery is much more common than this. So there are many risks which must be added to the baseline risk of anaesthetic death to give the real risk. As mentioned above, there are risks associated with the state of anaesthesia, with a given operation, with the patient and with the particular anaesthetist and surgeon. These may not be exactly quantifiable but will all be additive. The more closely we can form a personalised estimate of risk tailored to an individual case, the more the gap between population-based data and the subjective experience of that patient will narrow and the more informed that patient's decision will be.

RISK PERCEPTION AND ANAESTHETIC PRACTICE

Here I will concentrate on only one aspect of how risk perception can affect anaesthetic practice. Trainees in anaesthesia are encouraged to discuss potential problems or concerns with senior staff before undertaking difficult cases. The question is, are able to recognise problems and potential problems? We encourage them to discuss 'anything they are worried about'. However, this raises the issues of an individual's attitudes to risk and experience in recognising risk. We feel that the 'risk' of inexperienced anaesthetists is located in the imbalance between causing problems and being able to solve them. It is easy to get into difficulties, albeit minor ones, when one is inexperienced, and harder both to recognise and manage them. With experience, one is much better at handling problems but paradoxically less likely to get into trouble.

A supervisor needs to know, first and foremost, whether the trainee worries appropriately. "Will he be worried when he should be?" This is a fundamental clinical judgement in anaesthesia and the first of

Adams and Smith's two aspects of training in risk behaviour [12]. We should reflect a little on our own personality in relation to risk perception, and encourage trainees to do the same. There are conflicting pressures operating here. On the one hand, most trainees enjoy taking on more responsibility and autonomy, provided they feel it is around the limit of what they are confident with and not too taxing. They are also naturally reluctant to disturb their seniors, especially at unsociable hours. On the other hand, such judgement takes some time to develop, and in the meantime we think it is best if trainees are encouraged to bring even the slightest concern or query to the attention of someone more experienced. Even when trainee and supervisor agree on anaesthetic management, one might think that it was not necessary to ask the senior's advice. On the contrary. Not only is the responsibility for the risk then shifted to the supervisor, it also makes for high quality care. It cannot be right to have less experienced staff caring for complex patients without consultation and support in modern healthcare.

Adams and Smith's other aspect [12] is to work with trainees, encouraging them to articulate and itemise all the hazards the trainee feels may happen, when confronted with a difficult case. This moves them from the vague notion of a case that is simply 'risky' to a more concrete approach. Breaking down a global 'riskiness' into specific risks brings with it a greater sense of control over a threatening situation and also makes each risk practically more manageable in that a plan of action can be drawn up for each, both to reduce the chances of the potential hazard, and help recognise and manage it if it occurs.

PRACTICAL SUGGESTIONS FOR RISK COMMUNICATION WITH PATIENTS

- Remember that communicating any message depends critically on trust.
- Assume that all patients should be told as much as possible about risks and side effects. This may not always be possible, or even desirable, but we should avoid deciding on the patient's behalf what they should be told
- Be aware that words can convey feelings as well as facts. How do you want patients to feel about their anaesthetist and about themselves as they start to think about undergoing anaesthesia and surgery. Much of the preparation patients need to make is emotional and psychological and we can help with this - and it's not just about reducing anxiety.

- When communicating risks, we need to consider not only the patient's educational background but also their attitudes to risk. Attitudes to risk depend critically on perceived benefits. We should not try to 'second guess' other peoples' values.
- Face-to-face risk communication allows for more personal tailoring of risks and in fact including individual risk estimates tends to make risk communication interventions more effective [18]. The best way is probably to use a combination of words and numbers, supplemented by visual methods.

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