Classic cases revisited: Oscar the cat and predicting death

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Abstract

Uncertainty, although inherent in medicine, is rarely discussed in spite of being ubiquitous. Communication of uncertainty is poor due to anxiety associated with it, yet one could argue that lack of such disclosure could undermine trust, lead to perception of deceit, alter decision making and in some cases could invalidate the consent process. Predictions concerning end of life are particularly difficult and may lead to excessive or insufficient medical interventions. Acknowledging uncertainty when prognosticating outcomes, and in particular death, may help in facilitating patient-centred care in context of a critical illness.

Keywords

Uncertainty, end of life, communication

Medicine is a science of uncertainty and an art of probability.

William Osler

Doubt is an uncomfortable condition, but certainty is a ridiculous one.

Voltaire

Introduction

Oscar the Cat seems an unlikely contributor to the practice of critical care. Born in the United States and a resident feline practitioner at a nursing home, he was noted for his ability to identify dying patients. Clinicians, having spotted Oscar's uncanny ability for sensing impending death, did not buy a mass spectrometer to look for the ultimate particle of apoptosis or the aerosolized marker of death. They harnessed the seemingly unachievable feline 'certainty' to help families at a difficult time. Lacking such an asset within the majority of critical care units we are faced with uncertainty. This becomes particularly acute not only when we attempt to prognosticate death but also when applied to any intervention, no matter how evidence based. This article tackles our approach to predicting death and the need to acknowledge uncertainty in our practice of critical care medicine.

The case of Oscar

Oscar the Cat was born in 2005 and was one of six cats adopted by the Steere House Nursing and Rehabilitation Center in Providence, Rhode Island in the United States. He earned his fame through a publication in the New England Journal of Medicine in 2007.[1] Oscar was noted to make his own ward rounds in the nursing home, sniffing and observing patients. Indifferent to most, he would then decide to curl up on the bed of only certain patients. The patients he identified would invariably die within a few hours. The cat was so precise in his assessment of impending death, that the staff developed a protocol that required that patient's family to be called in, in anticipation of death. We read – 'His mere presence at the bedside is viewed by physicians and nursing home staff as an almost absolute indicator of impending death'.[1] The author of the article, geriatrician Dr David Dosa, later published a touching book about dementia – Making Rounds with Oscar: The Extraordinary Gift of an Ordinary Cat.[2] While the reliability on the cat may seem strange in modern health care settings, the family of a patient that died with Oscar at the bedside reported: 'it's not that we trusted the cat more than the nurse. Not, exactly. It was...well, there was just something about Oscar. He seemed so convinced of what he

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was doing. He was so clear in his intention and his dedication'. This underscored the importance of the prediction of death and the acknowledgement of the dying process.[2] As of January 2010, Oscar the Cat accurately predicted 50 deaths.[3]

Predicting death

Increasingly large numbers of patients die in a hospital environment. A significant number of deaths occur amongst patients admitted to intensive care.[4] It is natural for physicians to try to intervene and prevent death. It is clear that a number of deaths is anticipated and not unexpected but in spite of this, care is often deemed deficient.[5,6] Knowing which patients are destined to die regardless of intervention should make communication with the patient and the family easier, allow timely involvement of the palliative care team, and pave the road for the DNACPR decision. There is a problem with anticipating a certain outcome. In critical care where deterioration rather than improvement is the rule, there is a danger of self fulfilment of a prophecy that a patient will die.[7,8] Making a prediction of likely death, one may prejudice treatment that could prevent it. A way that many choose to follow, is to treat everybody with full organ support right up to the moment of death, and then provide cardiopulmonary resuscitation before acknowledging defeat. Acting this way is wasteful in terms of resources, violating justice in the utilitarian sense of the word, it may harm the patient, clearly does not benefit them, and often fails to respect autonomy by failing to acknowledge individual preferences or indeed by failing to treat the patient as the end in themselves.

The Office of National Statistics reports that the majority of deaths registered in the United Kingdom in 2013 were in the 80-plus age group.[9] The most common age at death was 86 for men and 89 for women in 2011–2013. In that period of time, a man aged 65 years had an average 18.3 years of life remaining and a woman had 20.8 years.[10] By contrast, in the ICNARC dataset the average age of patients in whom treatment had been withdrawn on ICU was 64.7 years.[5] This may reflect the fact that fewer elderly people are admitted to ITU. The trends however are towards longer life with no concept of a 'best before' age. In fact, one in three babies born in the United Kingdom in 2013 are expected to celebrate their 100th birthday with the average life expectancy increasing to 90.7 years for males and 94 years for females born in 2013![11] This is a reflection of a healthier lifestyle and perhaps of improved medical care. Longevity is not a guarantee of health. Frailty may accompany old age, but this is variable too. John Glenn was 77 when he undertook his last space mission in 1998 and Yuichiro Miura summited Mt Everest at the age of 80. Physical prowess is perhaps not the norm at the extremes of age, but older people are capable of feats of intellect

too. Daniel Callahan, an American Bioethicist at the age of 86 embarked on a comparative study of five global crises: global warming, food shortages, water quality and shortages, obesity and chronic illness. Baroness Warnock moral philosopher, born in 1924, has only retired from the House of Lords 2 years ago. Given the above examples, one should be wary of using age as the sole predictor of outcomes and a sole factor to base treatment decisions on. Instead, many have considered looking at disease severity.

In critical care, we are not short of physiological scoring systems that quantify the degree of physiological upset. Good examples of popular disease severity scoring systems are the Acute Physiology and Chronic Health Evaluation (APACHE II) Score and Simplified Acute Physiology Score (SAPS II) developed in 1985 and 1993, respectively.[12,13] They both correlate disease severity with the likelihood of mortality or other adverse outcome in a population of patients. They are research tools, and as such allowing comparison between patients, patient populations and healthcare facilities. With the APACHE II score, the authors advise us, that it can be used to

> *stratify acutely ill patients and assist investigators comparing the success of new or differing forms of therapy. This scoring index can be used to evaluate the use of hospital resources and compare the efficacy of intensive care in different hospitals or over time.*[12]

Similarly, the SAPS II score was developed for the purpose of the 'evaluation of the efficiency of intensive care units'.[13] Both scoring systems aim to relate severity of illness to experienced mortality, not to predict it. Other scoring systems abound but they are merely triage tools or epidemiological research tools.

It would seem that with experience, as clinicians, we are able to predict, which patients will die. Lord Falconer's proposed Assisted Dying Bill[14] stated that 'a person who is terminally ill may request and lawfully be provided with assistance to end his or her own life'. The Bill defined a terminally ill person as 'having an inevitably progressive condition which cannot be reversed by treatment and as a consequence of that terminal illness, is reasonably expected to die within six months'.[14] Therefore, we should be able to predict death within 6 months on the basis of the natural history of disease, patient functional status, etc. Yet, reading the script carefully, we may note the word 'reasonably', which assumes some degree of uncertainty. Predictions are laced with uncertainty and this is well illustrated by CAOS Study,[15] which highlighted 'unwarranted prognostic pessimism'. The tenth of patients with the poorest predicted prognosis had predicted 180 day survival of 3% and actual survival of around 36%.[15] In the ICU environment, some patients will illustrate the uncertainty associated

with end of life decision making and survive withdrawal or withholding of treatment. In a study by Cook and colleagues, this was seen in 3.6% of the limitation of life support group surviving to discharge after withdrawal of mechanical ventilation.[16] Nevertheless, a clinician's prediction of a poor chance of survival associated with the limitation of organ support is a more powerful predictor of intensive care mortality than illness severity, evolving or resolving organ dysfunction and the use of inotropes or vasopressors.[8]

Facing uncertainty

As stated above, our biological destiny that is death cannot be inferred purely from age, the physiological scoring systems are not applicable to individuals, and assertions made on the basis of clinical experience are all imbued with uncertainty. But what is uncertainty? Why does it exist? How does it affect us, and how can we cope with it? We forget that uncertainty is built into our lives. After all, the daily weather forecast has uncertainty built into it. From a philosophical standpoint, nothing is certain. Just because the Sun normally rises every day does not mean it will rise tomorrow, as David Hume famously asserted. In terms of what uncertainty is, one article concludes: 'exactly what is meant by the term uncertainty and the ethical justification for communicating different types of uncertainty are themselves uncertain'![17] A meta-cognitive definition by Paul Han asserts uncertainty to be a 'subjective consciousness of ignorance'.[18] In matters scientific, uncertainty is often considered in terms of probability. Probability is 'not a factual account of reality but linguistic construct(s) expressing a person's degree of belief or confidence about the future'.[18] Within any trial data, there is ambiguity or vagueness concerning the result, which may be expressed by using confidence intervals. But beyond mere statistical analysis, there are issues with the heterogeneity of the studied populations, biases, confounders and conflicts of interests and clinician is forced to interpret the data. At best, we have a signal if the data are good. Authors of Rational Diagnosis and Treatment, Henrik Wulff and Peter Goetzsche make a point of distinguishing between frequential and subjective probabilities.[19] The difference between the two depends whether you want to know probability of the result being true if the null hypothesis is true or the probability of null hypothesis being true. This is, in the authors' opinion, a difference between merely statistical and the pragmatic clinical approach to data. Or in other words do you trust statistics or do you trust the data? When faced with clinical decisions, we make assumptions based on available facts and reliant on those and our medical knowledge, we make predictions about treatment and outcome. Uncertainty has also a psychological dimension. 'We do not just think we are uncertain, we also feel uncertain' – asserts Michael Smithson.[20] Many equate uncertainty in psychological terms with anxiety. As such, it is understandable that it impacts on decision making. The more uncertain we are, the less likely we are to arrive at a decision. It is rare in medicine to see the flip side of uncertainty. For those who enjoy gambling, uncertainty may be a source of exhilaration. Uncertainty may metamorphose into fear – a fear of missing a diagnosis, a fear of failure.[21] Patient's fears (of death) will fuel the above-mentioned fear that doctors may have, leading to overdiagnosis and overtreatment.[21] Yet, uncertainty too has a positive, constructive, reassuring side. It detracts from deterministic ways of thinking. As Iona Heath comments, 'the great comfort is unpredictability of the future' and also 'the basis of scientific creativity, intellectual freedom, and political resistance is uncertainty. We should nurture it and treasure it and teach its value, and not be afraid of it'.[21]

Getting it right

We like to think in concrete and certain terms. We feel annoyed when faced with uncertainty. Imagine looking at a bus time table stating the bus should arrive now – yet a bus is nowhere in sight. Have you missed it? Is the timetable wrong? Or is the bus simply delayed? Even though it is ubiquitous in medicine, it is rare that we communicate uncertainty.[22] This may be paternalistic or a protective reflex. Likewise, we may assume that patients do not want to agonise over uncertainty. Yet, patients may want to know more than we think, as demonstrated recently in Montgomery case[23] making the consent process increasingly challenging. Likewise families of critically ill patients often want to know the 'odds'. It is an interesting choice of the language. The perceived lack of disclosure undermines trust, may lead to a perception of deceit and may invalidate consent. On the other hand, the acknowledgement of uncertainties may alter the way patients make their decisions. If a patient is simply told that the chemotherapy is given to cure the cancer then why not try it? If, on the other hand, a patient is told there is a chance it may cure the cancer, introducing uncertainty, their thought process might change. 'How big a chance, doctor?' They may ask. Pacetti and colleagues examined issues surrounding chemotherapy in the last 30 days of life of advanced cancer patients.[24] They concluded that while it is 'commonly acknowledged that age, performance status, tumor sensitivity, survival prognosis, and comorbidities should be considered in every chemotherapy decision-making' it is the individual clinician that is 'the only predictor for continuing chemotherapy in the last 4 weeks of life'.[24] We do find parallels in critical care.[8,16] Does this situation arise because of the lack of communication of uncertainty? After all, most chemotherapy requires consent.

Or is it a vestige of the paternalistic approach where doctor knows best?

There is a dichotomy in the approach to patients at the end of their lives. In the last 6 months of life in the United States, depending on the hospital, the proportion of patients referred to a hospice varied from 10.8% to 43.8% and those who died in ICU ranged from 8.4% to 36.8%.[25] How, in the absence of Oscar the Cat, do we navigate through this field of probabilities or uncertainties and societal expectations while delivering just and accountable care at the end of life? How do we make the right decision? Clinical encounters are often too short to fully explain existing uncertainties. Putting time into the consultation and improving communication can facilitate difficult decision making.[26] One of the reasons for the uncertainty is lack of sufficient, relevant information. In the digital era, patients and families all too readily access information on the internet. Reliability, validity or adequacy of such information is often poor. Provision of information that facilitates decision making for both health care professionals and families may reduce uncertainty and with it the anxiety surrounding the decision making process. Communicating uncertainty can help families to understand the complexity of illness, it can help to build trust and pave the way to shared decision making. Clinicians should learn when to say 'I don't know', should learn to handle uncertainty. Finally when practicing evidence-based medicine, we should be mindful that 'the increasing focus on personalized medicine mandates a more sophisticated understanding of the limitations and errors in applying and communicating population-based, epidemiologic findings to the individual'.[17]

Conclusions

The problem with statistics, no matter how good it is, is that it applies to populations and not individuals. The most learned physician with an evidence-based approach may still struggle to prognosticate for an individual. Uncertainty is inherent in life and in practice of medicine, yet society expects us to deliver certainty and 'scientific precision'. The greater the perceived uncertainty, the more emotionally challenging the decision making process. Good communication, including that of uncertainties surrounding the clinical problem, supported by good information is essential in overcoming doubt inherent in medicine. The interpretation of epidemiological or probabilistic data is still a task for a clinician. Ability to communicate the limitations of science to patients and families is an important, but perhaps time-consuming skill. It is likely that if resources remain limited, the handling of uncertainty will remain unsatisfactory. Uncertainty existing in clinical care can be harnessed in improving the delivery of care and fuelling future research.

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