Valorisation addendum

Introduction

In daily clinical activities decisions are largely governed by habits and previous experiences, so we continue to solve the same problems with the same solutions hopefully resulting in the same outcome or preferably better. The goal of medical science is to improve outcome and to provide evidence to change our approach in daily practice. But the magnitude of impact depends several factors. The magnitude of the study, i.e., level of evidence, determined by size of study, quality of the data acquisition and risk of bias for instance. And also how closely it relates to daily practice. For example, laboratory studies and animal studies, which are extremely important for understanding basic knowledge of health and disease. They rarely have a significant direct impact on daily clinical practice because it many steps need to be takes to introduce this knowledge in clinical practice. On the other hand, large scale randomized controlled trials comparing two treatment strategies have both magnitude as well as close relationship with daily practice. These can therefore result in a change in daily practice sometimes soon after publication.

So to translate these concepts to the studies presented in this thesis one might say although this thesis is comprised of clinical studies, these studies are not very large. Indeed, studies of up to 180 patients in a single center and more than 200 patients in a multi center study may be relatively small statistically speaking. For Western gastric cancer populations however, these are of a fair size. Even more so, magnitude of study results does not need to be singular and can be cumulative. For example the growing number of studies that are published on, for instance, geriatric frailty in surgical patients all add cumulatively to the total mass of the evidence. This is also true for other concepts presented in this thesis (sarcopenia, laparoscopic surgery and Quality of Life). To illustrate this one can type the following search terms into the Pubmed search engine: "geriatric", "frailty" and "surgery". This results in 'just' 335 hits, the first study dates from 1993 and the authors call out for implementation of geriatric assessment. The next studies do not appear until ten years later. After this a veritable explosion occurred of increasing number of published articles on this subject occurs.

The work in this thesis may not alter the daily practice in a groundbreaking way. It did help on a smaller scale to improve the results of this single centre by reducing the morbidity and mortality of gastric cancer surgery. Key concepts which are important to the treatment of gastric cancer patients are highlighted in this thesis and add to the already existing evidence that inevitably will affect treatment of gastric cancer and perhaps other patients.
Socioeconomic relevance

Medical studies, especially clinically focused studies, are inherently more broadly relevant than just scientifically. They are of interest to daily clinical practice and to patients, and by extension therefore of importance to their social network, the population as a whole, health insurance providers and healthcare administrators.

From a social and moral standpoint the question arises what level of risk is acceptable to perform surgery? If one could be able to reliably identify high risk patients, which level of risk would be considered too great to be acceptable? And who is to decide this threshold? Is it patients themselves, medical professionals or even health insurance providers? These questions are yet unanswered, but they suggest that studies aimed to help identify patients who are at an increased risk can potentially have far-reaching implications. For the moment frailty and nutritional status help us identify patients who are at risk. This information can be explained to patients and families and they can make treatment decisions together with physicians. These decisions take more into account such as a person's own frame of reference and other factors such as comorbidities. Perhaps in the future when risk assessment tools further improve the medical profession and society in general might have to deal with these, rather difficult, questions.

With health care costs seemingly ever expanding, gaining more insight in cost aspects of treatment is essential. This is not only to monitor costs but also to identify points at which costs can be reduced without deleterious effects on patient wellbeing or outcome. Managing costs is important to keep health care affordable and ensure the stable safety net our current healthcare system provides. The study in this thesis provides an insight into hospital related costs. These might be especially important when planning to negotiate implementation of laparoscopic surgery, which is discussed in the section below. This is because laparoscopic surgery is more expensive but may lead to cost reduction in other aspects of health care. On the other hand, more aspects come into play when considering cost-effectiveness of treatment. This will have to be further explored in other studies and will be a part of the Dutch LOGICA trial which compares open versus laparoscopic surgery for gastric cancer in a randomized controlled trial.
Implementing current results

Frailty and nutritional status have shown to be important predictors of outcome in a lot of studies. The difficulty is to determine in what way they should influence decision making. That still has to be determined. What can be implemented is the use of questionnaires to screen for elements of frailty and nutritional depletion. They can be administered by health care professionals and supporting nursing staff, but can also be administered on paper. This can also easily be performed prior to outpatient clinic visits. Although fraught with some difficulty, especially in elderly patients, these questionnaires can even be administered digitally either at the clinic or at home. However this last option will probably often rely on support from others and might therefore not always guarantee optimal results.

The implementation of how the information is obtained as described above is one aspect. The other important aspect of implementation is how this information should be used. Based on current results from studies in this thesis and other literature it is far too early to make treatment decisions based on frailty and nutritional status. However, the results underline the importance of screening for malnutrition and offering nutritional support when needed is paramount. Frailty can based on these results ad to preoperative decision making and informed consent. It can help identify high-risk patients and informing patients of these risks can help them and their families to make better decisions for themselves. Some patients might refrain from invasive surgery if it carries high risks and therefore decide not to undergo a procedure. Others might choose to proceed with surgery despite increased risk of adverse events, but their choice would be based on more complete information.

It has not yet come to a stage where measuring muscle mass and sarcopenia should be routinely performed on preoperative imaging. How sarcopenia impacts clinical outcome and how it may influence daily practice should first be elucidated further. However this thesis shows that the use of cheap open-source software such as Osirix to assess sarcopenia and muscle mass is well suited for research purposes. It is easy to use and has valid test characteristics (e.g., low inter-observer variability) as shown in other studies.

The implementation of laparoscopic surgery is already increasing. Laparoscopic surgery has been used as an approach for many surgically treatable diseases. After increased usage in the East the West is now also increasingly using laparoscopic surgery in gastric cancer patients. One major hurdle of implementing this new technique is that aside from safety aspects, dealt with in numerous previous studies, health-care administrators might be wary because of fears of increased
costs. Hopefully this thesis provides some evidence that this is not necessarily the case. There were no significant differences in costs between open and laparoscopic surgery. Major difference was increased cost related to the surgery itself (e.g., operating room and material usage) but this was compensated by a reduction in ICU and hospital stay resulting in similar overall costs. Although local prices and costs vary and are often dependent on volume and negotiated pricing of products, the general idea remains the same. New techniques do not always inherently introduce more expenses.

Quality of life remains very important and is becoming more and more recognized as an outcome parameter in recent years. The results from the study in this thesis can most easily be implemented in daily practice in the information patients receive regarding their surgical procedure. Gastric cancer surgery is intrinsically high risk not only as far as complications are concerned but especially with its influence on daily living. For instance, change dietary habits will occur as the gastrointestinal tract is altered by the surgery. Knowledge about the impact on daily living before the operation will improve the understanding and acceptance by patients. Other complaints such as pain, fatigue and dyspnoea may also be affected. An important finding of the quality of life study presented in this thesis is the fact that despite these complaints they tend to value their overall Quality of Life almost equal to healthy people.