Editorial

Should age be a criterion for intensive care unit admission in cancer patients?—Still an issue of uncertainty

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As life expectancy is rising globally and diagnostic and treatment modalities for cancer are improving, an increasing number of elderly patients with malignancies are requiring admission to the intensive care unit (ICU), either for cancer-related complications or for treatment-associated side effects. However limited ICU bed availability, concerns about inappropriate use of limited resources and uncertainties regarding the outcome, make ICU admission decisions for elderly critically ill cancer patients a challenging issue.

During the last few decades prognosis of cancer patients requiring ICU admission has significantly improved. Several studies have reported comparable ICU and hospital survival rates among critically ill patients with and without malignancy (1,2). This observation has led to a reappraisal of ICU admission policy for these patients. As a consequence, cancer patients comprise currently up to 20% of ICU admissions (3).

Despite recent advances, however, patients with malignant diseases still bear considerable risk of death in the ICU (4). The decision to apply life-sustaining technology to these patients involves weighing the potential benefit against a futile care. An appropriate selection of the critically ill cancer patients who may benefit from ICU care is crucial to avoid losing any chance of recovery and unnecessary deaths, but also the risk of prolonging the dying process, causing futile suffering on the patient and excessive burdens on the family and the community (5).

Previous reports on ICU outcomes and risk factors for ICU mortality in cancer patients have shown wide variability. This is explained, at least in part, by the marked heterogeneity of the populations studied (1-4,6,7). In a recent systematic review of 45 studies reporting on outcomes of critically ill patients with solid tumors, ICU mortality rates ranged from 4.5% to 85% (2). Most studies have included hematologic and solid cancer patients, patients admitted to the ICU for medical reasons and/or for postoperative care following elective surgery, different age groups and patients with and without early limitation of life-sustaining therapies (2,8). It is well known however, that ICU outcomes vary considerably in the different subgroups of such patients. Indeed, mortality rates as high as 43% and 58% have been recorded among patients with hematologic malignancies admitted to general ICUs as opposed to 20% to 27% observed in patients with solid tumors (1,9). Similarly, patients with medical indications for admission have a significantly increased risk of death in the ICU compared to those admitted after scheduled surgery for early-stage cancer (1,2,6). In a prospective multicenter Brazilian study, ICU mortality rate was 6% among surgical and 44% among medical patients (3).

Age, although not consistently, has been associated with the ICU outcome in cancer patients (10). Soares *et al.*, in a study evaluating the impact of age on survival in a large prospective cohort of critically ill patients with malignant diseases, reported that although ICU mortality

rates were similar between young and elderly patients, age was an independent risk factor for hospital and six-month mortality, especially in patients aged >60 years (11). Intensivists' perception that this group of patients carries a dismal prognosis along with the lack of definitive data might explain why critically ill elderly patients with cancer comprise a group with a high probability of being denied ICU admission (11). In fact, age and metastatic disease were factors associated with ICU refusal in a multicenter study assessing triage practices in 26 French ICUs (12).

In the previous issue of *Annals of Intensive Care*, Auclin and colleagues have studied the outcome of a cohort of 262 ICU elderly patients with solid tumors using data from a database of 2,327 elderly patients admitted to a French ICU (13). The authors have selected a relatively homogeneous patient population: they have excluded patients younger than 65 years, those with hematologic malignancies and those with early active treatment limitation. All but one patient had medical indications for ICU admission. The reported ICU mortality rate was 34%, similar to that of critically ill elderly patients without cancer. In-hospital and 90-day death rates were also acceptable (44% and 52%, respectively). Their findings suggest that the mere presence of a solid tumor in an elderly patient should not preclude provision of ICU care.

The authors also reported that SAPS 2 score and primary tumor site were risk factors for 90-day mortality, while gastrointestinal and lung tumors, poor performance status and cancer progression were associated with definite anticancer treatment cessation (13). These findings corroborate the existing evidence that although short-term mortality of critically ill cancer patients is mostly related to the severity of the acute illness, long-term outcome seems largely dependent on the characteristics of the tumor (10). The poor long-term prognosis of patients with lung cancer has been previously demonstrated. In the study by Bonomi *et al.*, two thirds of elderly patients with advanced non-small cell lung cancer were discharged from the ICU, but only 19% of them received chemotherapy and/or radiotherapy while the 1-year survival fell dramatically to 10% (14).

Pre-admission performance status has been repeatedly associated with short- and long-term mortality and has been proposed as a selection tool for patients referred to the ICU (3,15). According to current literature, patients bedridden over the past three months, patients with cancer progression and short anticipated survival and those with no lifespan extending treatment options should not be considered eligible for ICU admission (16). In the study by Auclin *et al.* patients had been carefully selected for ICU management, as poor performance status and cancer progression were recorded in only 13% and 15% of their cohort, respectively (13).

It should be noted however, that the ICU and hospital survival should not be the only parameters determining the outcome of ICU care. Long-term (up to 1 year) survival as well as health-related quality of life, post-ICU burden, functional status and ability to resume anticancer therapy following ICU discharge are important quality outcome issues that unfortunately have not been adequately addressed (17).

In this context, the most interesting aspect of the study of Auclin and co-workers is the finding that almost half (53%) of ICU survivors with an indication for additional anticancer therapy were able to receive treatment (13). This is an encouraging finding, considering that high prevalence of co-morbidities, reduced functional capacity associated with aging and aggravated by ICU care and age-related complications might preclude provision of antineoplastic therapies to elderly patients. Notably, the resumption of anticancer treatment after ICU discharge is clinically important as it is expected to have a beneficial impact on the long-term survival of these patients. Unfortunately, the authors do not present any information about the long-term outcome of their cohort and this is the main weakness of the study. In a previous study, Roques *et al.*, have found that patients with lung cancer who received specific anticancer treatment after ICU discharge had a much higher six-month survival rate compared to those who did not (79% *vs.* 21%) (18).

Although the study of Auclin *et al.*, showed that in elderly critically ill cancer patients ICU care may be associated with meaningful short-term outcomes, several uncertainties still remain regarding their long-term outcome, overall survival, continuation of life-extending therapy and health-related quality of life (19). Even though prediction of an individual patient's prognosis will probably remain elusive, there is an urgent need for studies addressing these issues in homogeneous groups of patients, as they should constitute the essential goal of intensive care beyond ICU and hospital survival.

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Footnote

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to declare.

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