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Overview of Current Intensive Care Services in Hungary

Introduction

The Hungarian Society of Anaesthesiology and Intensive Therapy (MAITT) was founded as a section within the Hungarian Surgical Society in 1958. Since then, anaesthesia became an independent specialty, and in 1978 it was linked with intensive care. There are four medical universities in Hungary, and during the late 1970s all of them established an Anaesthesia and Intensive Care Department, with the Semmelweis University, Budapest, being the most recent to do so in 1991 (52 years later than in Oxford, England).

There are now 89 intensive care units (ICUs) in Hungary. Traditionally these units were divided into so called city hospitals, county hospitals and university hospitals, which represented the level of care, with city hospitals providing only short-term ventilation, whereas university hospitals were able to look after patients with multi-organ failure. Nowadays, ICUs are categorised as level 1, level 2 and level 3, based on the facilities of the ICU rather than the size of the city itself. During the years spent in the Eastern Block, healthcare bed provision in Hungary was not a major issue: each city had its hospital, and the services provided were more dependent on political relationships than on the actual need for them. This has changed now: each hospital has its territory precisely set and the level of care is determined by the central, but not by the local, government.

Funding of Intensive Care in Hungary

Funding of intensive care services is done by a diagnosis related group (DRG), which was introduced in 1993. The main aim of implementing this system— as with almost anywhere in the world— was to reduce healthcare costs. This had led to severe underfunding of intensive care in Hungary. The difference between the actual costs incurred and the reimbursement provided can often be up to three times; but in one extreme example of a case report, in which a patient suffered from tetanus and spent 102 days on the ICU, the actual cost was 4.4 times more than the reimbursement given (Ocsai et al. 2008). Individual funding does not exist; therefore, hospitals refrain from overspending. The Major Problems with intensive care funding in Hungary are:

1. DRG is a hospital funding system, in which intensive care receives only part of the full DRG reimbursement. Those, who have prolonged length of stay are not taken into account.
2. The complexity of care at level 3 is not reimbursed; level 3 ICUs receive the same amount as Level 1 ICUs; and
3. Equipment costs, maintenance and depreciation are not covered by DRG funding. Hospitals do not have a budget for equipment.

The significant inherited economic difficulties make it very unlikely that funding itself can be increased. Although the total expenditure on health as a percentage of Gross Domestic Product (GDP) is similar to other European countries, the GDP per capita is less than half (Csomos et al. 2005). Furthermore, although there is an increase in per capita spending each year, this can only match the continuous rise in healthcare expenditure.

Organisation of Intensive Care

Apart from intensive care funding, there are nationwide organisational problems as well. This has been shown in the analysis of Hungarian national intensive care data collected between 2000 and 2010, which was presented at the ISICEM Congress 2012 (Csomos et al. 2012). Results showed that during the last 10 years, the total number of active hospital beds decreased dramatically by 33.4% (from 65,532 to 44,300); however, the number of intensive care beds increased by 9.8% (from 1,189 to 1,306). As a result, the percentage of ICU beds to hospital beds increased from 1.89% in 2000 to 2.95% in 2010. The intensive care bed occupancy rate ranged between 58.43% and 63.78%; it showed no correlation with the case mix index (CMI) ($r^2=0.2799$). The number of days spent on ventilator increased from 28.9% to 66.1%, showing good correlation with CMI ($r^2=0.9125$). Looking at the distribution of services for 2010, there was significantly lower mortality in level 3 units ($30\% \pm 18\%$) compared to Level 2 ($51\% \pm 20\%$) and level 1 care ($56\% \pm 19\%$) ($P=0.001$ and 0.003), without significant differences in CMI. In 2010, the mean ICU bed occupancy rate was 59.5% (SD $\pm 12\%$), and length of stay was 12.3 days (SD ± 3.0). Geographic distribution of intensive care beds per 100,000 population ranged between 7.3 and 27.4 (nationwide average: 12.9 per 100,000). This showed no correlation with regional GDP values ($r^2=0.4593$). This implies that there is still an unequal distribution of ICU services across the country. The nationwide number of ICU beds per 100,000 population is higher than in the UK, despite Hungary having a much lower GDP. The increase in the number of intensive care beds during 2000 and 2010 does not seem to be justified in Hungary; what is needed before this rises any higher is for more attention to be paid on improving bed occupancy rate.

Quality of Care

The quality of care in intensive care varies widely across the nation. This is caused by the virtually non-existent quality-control mechanism. There is a National Board of Anaesthesia and Intensive Care, which works hard in implementing international guidelines and/or creating protocols, including national guidelines on sepsis, acute respiratory distress syndrome, and interhospital transfer, among other areas; however,

the adherence to these guidelines is not monitored. This was clearly shown in a recent national survey, which focused on some educational issues of junior doctors as well as quality indicators of intensive care (Bogar et al. 2012). Invasive blood pressure monitoring is only performed in 66% of patients at level 2; further to this, invasive haemodynamic monitoring is only performed in 46% of patients in level 3 care. This is an unacceptably low number, and one of the reasons is inadequate funding. As an example, quite a few level 3 ICUs cannot afford to buy disposables for invasive haemodynamic monitoring. Furthermore, there is a very low nurse-ICU bed ratio. In the study by Bogar and colleagues, the correlation analysis of the number of nurses and the monitoring frequency showed a significant relationship: $r=0,300$, $P<0,01$ (Bogar et al. 2012).

Number of Nurses

The number of nurses per bed is lower in Hungary than in Western countries, varying between 1.7 and 2.9 (Bogar et al. 2012). There is plenty of evidence in international literature about the positive effect of the number of nurses on ICU outcome. This was also confirmed by a Hungarian study, which conducted a five-year retrospective survey analysing the effect of an adequate number of nurses (Mikor et al. 2008). The study included 449 patients who were treated with multi-organ failure over the observed period. Multivariate regression analysis revealed that the best independent predictors of mortality were the simplified acute physiology score II ($P<0,001$), the number of nurses ($p<0,001$) and age ($P=0,021$).

Education

Anaesthesia together with intensive care is a well recognised basic specialty in Hungary. There is a five-year training programme, including a set time spent in each subspecialty, and two years out of five is to be spent in accredited ICU. The curriculum of training has traditionally been set by the four university departments, and the Competency-Based Training in Intensive Care (CoBaTrICE) syllabus is now translated and awaiting implementation. The national specialist exam consists of an multiple-choice question (MCQ) part and a viva. There was an agreement signed in 2006 between the Ministry of Health in Hungary and the European Society of Anaesthesiology about using part 1 of their exam as the Hungarian national examination. The MCQs are translated into Hungarian. This year, 79 candidates from Hungary took the exam, and the overall pass rate was only 41.77%. Since 2008, it has also been possible to take an independent intensive care specialist exam on top of a few basic specialties: internal medicine, paediatrics and cardiology.

Number of Doctors

The number of doctors working in Hungarian ICUs is way below the international recommendations. For example, it is common practice, especially in small hospitals, for a doctor to provide anaesthesia and ICU cover at the same time, during the daily routine and during on call hours alike. Needless to say, it is due to an inadequate number of doctors in the nation's system. Furthermore, physicians' workload has increased by 13.2% in line with the rise in the total number of anaesthetic procedures performed per physician per year in last five years (Nagy et al. 2010). According to Ministry of Health data, only 53% of doctors (182/341) who became specialists in the last five years still work in Hungary. This is a striking number and should warrant the attention of any healthcare provider. However, instead of making moves to improve the conditions, the Ministry of Health introduced a new law last year, which stipulated that doctors who complete their specialist training in Hungary have to sign an agreement that they will work in the country for the same length of time as the duration of their training. Despite all of the above difficulties, we have a very active and enthusiastic intensive care community, which is willing to change the system. The quality and attendance rate of our national and regional conferences has been extremely high. Research activity is also on the rise. Our international relationships are getting stronger, and now we know that countries of the former "Eastern Block" are facing similar difficulties to us. Therefore, we are trying to join forces on several forums and improve critical care practice and training in this region of Europe as best we can.

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