Coded Adverse Events in Austrian Hospitals from 2001 to 2006

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OBJECTIVES

Adverse Events (AEs) are unintended injuries or complications resulting in death, disability or prolonged hospital stay deriving from health care management.
The concern about patient safety in Austria is growing constantly, but Critical Incident Reporting Systems or Risk Management Systems are not yet implemented nationwide. Therefore little is known about the frequency of AEs in Austria. The reimbursement data of hospital discharges include ICD-10 coded diagnosis data related to AEs.

T36-T50 Poisoning by drugs, medicaments and biological substances
T36 Poisoning by systemic antibiotics
T37 Poisoning by other systemic anti-infectives and antiparasitics
T38 Poisoning by hormones and their synthetic substitutes and antagonists, not elsewhere classified
T39 Poisoning by nonopioid analgesics, antipyretics and antirheumatics
T40 Poisoning by narcotics and psychodysleptics [hallucinogens]
T41 Poisoning by anaesthetics and therapeutic gases
T42 Poisoning by antiepileptic, sedative-hypnotic and antiparkinsonism drugs
T43 Poisoning by psychotropic drugs, not elsewhere classified
T44 Poisoning by drugs primarily affecting the autonomic nervous system
T45 Poisoning by primarily systemic and haematological agents, not elsewhere classified
T46 Poisoning by agents primarily affecting the cardiovascular system
T47 Poisoning by agents primarily affecting the gastrointestinal system
T48 Poisoning by agents primarily acting on smooth and skeletal muscles and the respiratory system
T49 Poisoning by topical agents primarily affecting skin and mucous membrane and by ophthalmological, otorhinolaryngological and dental drugs
T50 Poisoning by diuretics and other and unspecified drugs, medicaments and biological substances
T80-T88 Complications of surgical and medical care, not elsewhere classified
T80 Complications following infusion, transfusion and therapeutic injection
T81 Complications of procedures, not elsewhere classified
T82 Complications of cardiac and vascular prosthetic devices, implants and grafts
T83 Complications of genitourinary prosthetic devices, implants and grafts
T84 Complications of internal orthopaedic prosthetic devices, implants and grafts
T85 Complications of other internal prosthetic devices, implants and grafts
T86 Failure and rejection of transplanted organs and tissues
T87 Complications peculiar to reattachment and amputation
T88 Other complications of surgical and medical care, not elsewhere classified

METHODS

Since 2001 ICD 10 coding is mandatory in Austrian hospitals [1], before 2001 ICD 9 was used. ICD 10 codes T36-50 and T80-88 correspond to 960-977 and 996-999 in ICD 9.
We investigated if these data could be used reliably to show the incidence of AEs. We examined the frequency of diagnoses from the ICD-10 groups T36-T50 and T80- T88 during the years 2001 to 2006, either as “Main Diagnosis” or as “Secondary Diagnosis”. We investigated the age distribution, the frequency of stays in the intensive care unit and length of stay. We looked also into the death rates related to AEs, furthermore we were interested in the amount of money spent on the DRG system associated with AEs.
Descriptive:
Total number of hospital stays from 2001-2006 according to ICD 10
Diagnoses T36-50 and T80-88 from 2001-2006
Main diagnoses T36-50 and T80-88 from 2001-2006
Main diagnoses with discharge parameter “death” T36-50 and T80-88 from 2001-2006
Secondary diagnoses with discharge parameter “death” T36-50 and T80-88 from 2001-2006
Ranking of the most frequently used ICDs in the field of adverse events
Relational:
Points / Main diagnosis / 2001-2006
Costs in € / Main diagnosis / 2001-2006
Hospital stays / Secondary diagnosis / individual medical procedures (IMP)
Average total points / hospital stays secondary diagnosis
Average total points secondary diagnosis adverse events / average total points secondary diagnosis hospital stays

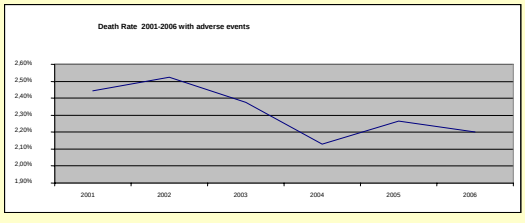
RESULTS

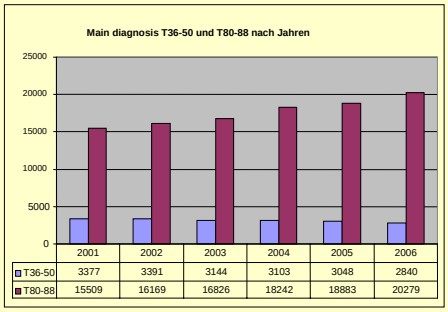
Those adverse events that were coded according to the ICD 10 code are displayed by hospital stays but not by persons. Only data including the discharge parameter “death” can be traced back directly to persons.
294.848 hospitalisations out of a total of 13.841.467 were caused or complicated by AEs during the years 2001 to 2006. The most frequently coded diagnoses concerning adverse events were T46, T50,T81,T82,T84 and T88, in both main and secondary diagnosis.
Complications of surgical and medical care correlate mostly with illnesses of the circulatory system, neoplasms, injuries and poisoning, illnesses of the muscular- and skeletal system, of the alimentary system and of the urogenital system. Any conclusions concerning cause and effect can not be drawn. The average mortality rate for patients with one main diagnosis or secondary diagnosis concerning adverse events was 2,32 % compared to 1,66 % of all hospitalisation episodes.
From 2001-2006 2,5 billion € were spent on hospital stays with adverse events as a main or secondary diagnosis. Group 1 ICD10 T36-50 € 133.391.313; Group 2 ICD10T80-88 € 2.403.460.433

Only official cases have been reported, therefore cases with the wrong coding or cases that have not been reported have to be taken into consideration for a valid interpretation.

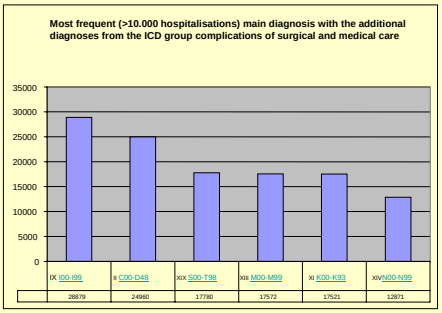
For group 1 (T36-50) and group 2 (T80-88) 1181 different individual medical procedures were coded,1062 there from more than once and 194 more than ten times. The top 3 coded IMPs are listed below.

MEL (IMP) Code	MEL Text BMGF, LKF Katalog 2008
6001	Aorto-/ Arteriographie (inkl. Hirnarterien) mit/ ohne digitalen Subtraktionsverfahren
7270	Nicht invasives Monitoring auf neonat./päd. Intensiveinheiten
6261	(3-D)-Computertomographie pro Körperregion, inkl. CT-Angiographie





Coding of AEs as a result of surgical interventions or other medical procedures has increased during this 6 year period, 87 % of all coded Aes, whereas coding of AEs caused by drugs decreased, 13 % of all coded AEs.
The most frequently coded diagnoses concerning adverse events were in both main diagnosis and secondary diagnosis T46, T50, T81, T82, T84 and T88



The six most frequent main diagnosis with the additional diagnoses from the ICD group complications of surgical and medical care, not elsewhere classified (T80-88; group 2) from 2001-2006

CONCLUSIONS

For 2 % of the hospital episodes AEs were coded as main or secondary diagnosis. The literature shows different rates of AEs in hospitals, from 2,9 % up to 16,6 %.[3,4] Coding of AEs as a result of surgical interventions or other medical procedures has increased during this 6 year period. Correlations can be noted between surgical procedures, the length of stay and AEs. The rate of coded AEs caused by drugs in our reimbursement data is much lower than in other healthcare systems. One of the second most coded IMP for adverse events concerns the pediatrics and neonatoloigcal intensive care; you can find similar information in the literature. [2] Death rates of hospital stays with AEs are 2,3 % compared to 1,66 % of all hospitalisation episodes.
The limitation of the obtained results concerns the estimated number of non reported and non coded AEs, the quality, as well as the reliability of correct coding. Underreporting is very likely, so we assume that the real number is much higher than the reported AEs. One major conclusion was the high potential for improvement of the patients’ security in the surgical and pediatrics and neonatological intensive care. 37 % to 51 % of AEs are said to be avoidable. Therefore, at least 19.000- 25.000 AEs per year could be avoided in Austrian hospitals.

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[3] Brennan TA, Leape LL, Laird NM, et al. Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I. N Engl J Med 1991;324:370-6.
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