Internal psychosomatic medicine within the German Diagnosis Related Groups System

Internistisch-psychosomatische Medizin im deutschen Fallpauschalensystem G-DRG

Abstract
A model calculation was used to assess whether the G-DRG version 1.0 sufficiently represents integrated internal psychosomatic treatment of patients with psychosomatic disorders in relation to diagnosis and resource consumption. The DRGs of the Major Diagnostic Category "Mental Diseases" of the German DRG calculation sample 1.0 (diagnoses, procedures, cost weights) were analyzed. In a division of psychosomatic medicine within a general internal department, proceeds regarding 241 patients treated between 01 Jan and 31 Dec 2002, calculated according to the G-DRG version 1.0, were compared to the costs accrued. The G-DRG version 1.0 includes 7 DRGs of psychosomatic disorders in internal medicine (excluding disorders due to substance abuse). Assuming a base rate of € 2,900, the total proceeds of the G-DRG Version 1.0 exceeded the costs (+ € 57,971 /year).

Zusammenfassung
Es wurde in einer Modellrechung überprüft, ob eine integrierte internistisch-psychosomatische Versorgung von Patienten mit psychosomatischen Erkrankungen in der G-DRG Version 1.0 bezüglich Diagnosen und Ressourcenverbrauch abgebildet ist. Dazu werden die Daten der DRG's der Hauptdiagnosegruppe „Mentale Erkrankungen“ der G-DRG-Kalkulationsstichprobe 1.0 (Diagnosen, Prozeduren, Kostengewichte) dargestellt. Die Erlöse eines psychosomatischen Funktionsbereiches einer medizinischen Klinik des Jahres 2002 mit 241 Patienten nach G-DRG Version 1.0 sowie dessen Kosten wurden verglichen. Psychische Störungen in der Inneren Medizin (ohne Störungen durch Substanzgebrauch) sind im G-DRG Version 1.0 durch 7 DRG's abgebildet. Die Gesamterlöse des psychosomatischen Funktionsbereiches sind bei Annahme eines Basisfallwertes von € 2.900 nach G-DRG Version 1.0 höher als die Kosten der psychosomatischen Behandlung (+ € 57.971 /Jahr).

Introduction
A comorbidity of mental disorders can be diagnosed in 36% of consecutive in-patients in German departments of general internal medicine at primary as well as tertiary care level. In 13-14% of the patients, the mental disorder can be regarded as the main diagnosis [1], [2]. In Germany, psychosomatic care of patients with mental disorders in internal departments is provided by psychiatric-psychosomatic consultation or liaison (CL) services, by working groups of specialists in psychosomatic and somatic medicine, by integrated internal-psychosomatic departments and by departments of psychosomatic medicine and psychotherapy [3]. The majority of German hospitals do not have a department of psychosomatic medicine or psychiatry, or a psychiatric or psychosomatic CL-service [4]. On 1st of January 2004, the German Diagnosis Related Group system (G-DRG) was introduced as the basis for funding of all hospital outputs with the exception of psychiatric and psychotherapeutic medicine, replacing the hitherto existing funding by per day payment. Psychosomatic divisions in internal medicine (integrated internal-psychosomatic departments) must therefore secure their economic survival within the G-DRG system.
Methods

Aims

To assess the representation and financing of integrated internal psychosomatic care within the G-DRG system we analyzed the calculation sample of the Major Diagnostic Category (MDC) 19 “Mental Disorders” of the G-DRG version 1.0. Using a hypothetical calculation, the costs and proceeds of a psychosomatic division within a general internal department of a German hospital at tertiary care level were calculated and compared with its resource consumption.

Setting and sample

The current regional plan of hospitals funded by the Ministry of Health of Saarland did not establish departments of psychosomatic medicine and psychotherapy but two psychosomatic divisions in general internal departments within two hospitals [5]. The hospital where the present study was carried out opted for the model of integrated internal psychosomatic care for its psychosomatic division. This university hospital has two medical departments: the Department of Internal Medicine II with cardiology, pneumology, angiology and intensive care, and the Department of Internal Medicine I with gastroenterology, hepatology, endocrinology, infectious diseases and psychosomatic medicine. At the time of the study, the Department of Internal Medicine I included three medical wards. Patients with infectious diseases requiring isolation were admitted to ward A (27 beds), patients with private medical health insurance to ward B (28 beds) and patients with internal psychosomatic diseases to ward C (26 beds). All other patients admitted were equally distributed to the three wards. Patients who were admitted with a suspected somatic disease and who were diagnosed with a psychosomatic disorder as the result of internal psychosomatic diagnosis were assigned to the psychosomatic division. In line with the hospital management system, the costs of the psychosomatic division are registered separately from the costs of the internal department. Patients with known psychosomatic diseases were only admitted to the hospital due to somatic complications of their psychosomatic disease requiring inpatient treatment or for the purposes of crisis intervention. Each ward was attended by one senior physician, one ward physician and one resident. They were also responsible for all patients of ward C [6]. At the time of this study, the senior physician of ward C was also the specialist in psychosomatic medicine and head of the psychosomatic division. There was a rotation of two ward physicians caring for ward C and at the time of this study, both of them were in or had completed advanced specialization in internal medicine and psychotherapy. The residents were trained in psychosomatic basic care. The following psychotherapeutic procedures were available:

- Single and family psychotherapeutic sessions to promote the acceptance of the diagnosis of a psychosomatic disorder including patients’ and relatives’ education by booklets and videotapes [7]
- Introduction to self-management techniques based on behavioral medicine, relaxation training (relaxation through self-hypnosis, Jacobson progressive muscle relaxation) and hypnosis [8]
- Behavioral nutritional therapy in eating disorders [9]
- Crisis intervention and supportive therapy (two psychotherapeutic sessions a week ranging from 25 to 50 minutes) for patients with known psychosomatic disorders
- Active organization of further outpatient psychosomatic care (psychosomatic basic care, psychiatric-psychotherapeutic or psychotherapeutic care)

All patients admitted to the psychosomatic division between 1st of January and 31st of December 2002 were included in the study.

Variables and instruments

The data of the sample of hospitals which were used to arrange and calculate the DRGs of the MDC 19 of the G-DRG version 1.0 [10] were analyzed for their diagnoses according to the International Classification of Diseases (ICD) of the World Health Organization, the procedures provided and costs, and were compared with the data of the study sample. The diagnoses made on admission to hospital of the study sample, the procedures provided during the hospital stay as well as the recommendations for further psychosomatic therapy were collected from the charts and the data of the medical controlling department. The costs assigned to the psychosomatic division were made available by the management department of the hospital. To calculate the proceeds according to the G-DRG version 1.0, the patient data were grouped by a batch-grouping procedure using the grouper KODIP DRG-Scout (version 0.9, SBG, Berlin). The cost weights according to the directive on the DRG-system for hospitals as of 19th of September 2002 were used [11]. A fictitious base rate of € 2,900, which was also used in other hypothetical economic calculations within the G-DRG system [12], was assumed.

Statistics

Data derived from descriptive statistical analysis are presented in the form of percentages for category variables and of the mean ± 1 standard deviation (SD) and range for continuous data.

Results

The data of the G-DRG calculation sample and its DRGs of the MDC 19 (Mental Disorders) are presented in table 1 and table 2. The DRGs according to the directive on the DRG system for hospitals as of 22nd of October 2003 [13] are added in table 1 in brackets.

8575 patients from the...
Table 1: Diagnosis related groups (DRGs) of the major diagnostic category (MDC) "Mental Disorders" and proceeds in the G-DRG System Version 1.0 (Version 2004 in brackets)

[* DRG U68Z - Mental disorder in childhood is not included in the table]

| DRG  | Descriptive Text                                      | Average length of stay [Days] | Cost weight | Proceeds [€], base rate of € 2,900 |
|------|-------------------------------------------------------|-------------------------------|-------------|-----------------------------------|
| U60Z | Psychiatric treatment, one day                        | 1.0 (1.0)                     | 0.168       | 487 (554)                         |
| U63A (U63Z) | Severe affective disorder with extreme or severe CC, (Age > 65 years) | 13.4 (13.5) | 1.1 (1.205) | 3190 (3494)                     |
| U63B (U64B) | Severe affective disorder, age <70 (65 years without extreme CC) | 8.6 (8.6)  | 0.878 (0.757) | 2546 (2195)                     |
| U64Z (U64A) | Other affective or somatoform disorder (Age >65 years without CC) | 6.3 (13.4) | 0.726 (1.118) | 2170 (3242)                     |
| U65Z | Anxiety disorder                                      | 3.8 (8.0)                     | 0.608       | 1763 (2172)                       |
| U66Z | Eating and obsessive-compulsive disorder (acute psychic reaction) | 6.1 (11.2) | 0.687 (0.970) | 1992 (2813)                     |
| U67Z (no more included 2004) | Personality disorders and acute psychic reactions | 4.9 | 0.611 | 1772 |
Table 3: Major Diagnostic Categories of 241 patients treated by the psychosomatic division in the year 2002

| DRG     | Text                                           | Absolute | %   |
|---------|------------------------------------------------|----------|-----|
| U 65Z   | Anxiety disorder                               | 30        | 12.4|
| U 65B   | Severe affective disorder, age < 70 years without extreme or severe CC | 28        | 11.6|
| U 65Z   | Psychiatric treatment – one day                | 20        | 8.3 |
| U 66Z   | Eating- and obsessive-compulsive disorders     | 10        | 4.1 |
| U 67Z   | Personality disorders and acute psychic reactions | 9         | 3.7 |
| G x     | Gastrointestinal diseases                      | 40        | 16.6|
| V       | Substance induced disorders                    | 22        | 9.1 |
| F       | Heart diseases                                 | 15        | 6.2 |
| E       | Pulmonary diseases                             | 14        | 5.8 |
| B, H, I, K, L, R, S, T, Z | Other diseases | 53 | 21.9|
| Sum     |                                                 | 241       | 100.0|

A hospital in which the study took place were included in the composition of the calculation sample of the G-DRG version 1.0.

Unlike the Australian (AR) DRG system, the DRGs for "psychiatric" disorders (U 61A and B: schizophrenic disorders and U 62A and B: paranoid and other psychiatric disorders) are not included in the G-GRD system. The descriptive texts of the DRGs of the AR-DRG system were taken over by the G-DRG system. However, the patients in the German calculation sample which were clustered to the DRG U 65Z (anxiety disorder) were mainly diagnosed with somatoform disorders. Psychotherapeutic procedures (OPS 9-402.x and 9-405.x) were not or only rarely coded (0-12%) in the calculation sample. The G-DRG version 2004 included a partial modification of the MDC 19 with higher cost weights for the DRGs U 64A and B, U 65Z and U 66Z (somatoform, anxiety and eating disorders).

From 1st of January to 31st of December 2002, 3020 patients were treated by the Department of Internal Medicine I. 241/3020 patients (8%) with an average stay of 6.12 ± 3.8 (range 1-47) days were assigned to the psychosomatic division. The initial diagnosis made on admission was somatic disease in 61 patients, somatoform disorder in 177 patients, depressive disorders in 29 patients, anxiety disorders in 24 patients, substance induced disorders in 11 patients, and other mental disorders in 18 patients. In 133 (55.2%) of the patients, psychotherapeutic procedures (OPS 9-405.x) were coded together with the main diagnosis and in 38 (15.8%) patients, with the additional diagnoses. In 94 (39.0%) of the patients, other procedures were coded: in 56 (23.2%) patients, endoscopic procedures (OPS 1-63, 1-64,1-65), in 24 (10.0%) patients, imaging procedures (OPS 3.x), in 13 (5.4%) patients, pulmonary procedures (OPS 1-7.x), in seven (2.9%) of the patients both surgical and non-surgical procedures (OPS 5 and 8) and in 4 (1.6%) patients, neurological procedures (OPS 1-20.x). In 48 (19.8%) of the patients, a consecutive psychosomatic basic care, in 67 (27.7%) patients, outpatient psychotherapy, in 43 (17.7%) patients, outpatient psychiatric therapy and in 23 (9.5%) patients, in-patient psychosomatic rehabilitative treatment was recommended. Four (1.6%) of the patients were transferred to a department of psychiatry and psychotherapy.

The patient clinical complexity level (PCCL) (economic severity depending on age, main and additional diagnoses) was 1.6 ± 1.3 (range 0-3), the effective case mix index (average cost weight including extra charges and discounts in case of exceeding or falling short of the fixed limits of hospital stay or transmission to another hospital) was 0.69. There were no discounts due to the refusal of funding by the health insurance. With an effective case mix of 166.55 and an assumed base rate of € 2,900, the proceeds of the psychosomatic division would have been € 482,986 in the hypothetical calculation. The average costs per patient compared to the costs of the G-DRG calculation sample of the MDC 19 are presented in table 4.

The resource consumption of the psychosomatic division was € 321,351 in the year 2002.
Table 4: Mean costs of the DRGs of MDC 19 "Mental disorders" of the calculation sample G-DRG Version 1.0 (€) [10] compared to the average costs of patients treated by a psychosomatic division in the year 2002 (€)

| DRG  | Personnel costs physicians [€] | Personnel costs nursing [€] | Personnel costs technical and medical assistance [€] | Costs of material, Medicaments, Implants and medical requirements [€] | Costs of personnel and material medical and non-medical infrastructure [€] | Total [€] |
|------|-------------------------------|----------------------------|-----------------------------|-------------------------------------------------|-------------------------------------------------|----------|
| U60Z | 75                            | 132                        | 64                          | 51                                              | 175                                              | 487      |
| U63A | 438                           | 705                        | 418                         | 273                                             | 1504                                             | 3337     |
| U63B | 407                           | 527                        | 270                         | 231                                             | 1105                                             | 2538     |
| U64Z | 317                           | 466                        | 224                         | 269                                             | 823                                              | 2099     |
| U65Z | 287                           | 355                        | 249                         | 191                                             | 777                                              | 1759     |
| U66Z | 254                           | 592                        | 207                         | 193                                             | 740                                              | 1986     |
| U67Z | 229                           | 481                        | 204                         | 136                                             | 716                                              | 1766     |
| Psychosomatic Division 2002 | 473                           | 564                        | 127                         | 7                                               | 163                                              | 1334     |

Case Examples

In order to highlight differences between departments of psychosomatic medicine and psychotherapy, the working approach of the presented internal psychosomatic division is illustrated by case examples.

Case 1: The male 38 years old patient presented himself for a second time within eight days at the internal emergency department of the hospital at night because of a feeling of thoracic pressure, palpitations, feeling of heat, diffuse vertigo and nervousness. On first contact eight days previously, a myocardial infarction had been excluded and further outpatient internal and neurological diagnostics had been recommended. The family doctor of the patient had arranged appointments for cranial computed tomography (CCT) and cardiological diagnostics. The patient was admitted to ward C. A psychosomatic interview, which was carried out the next morning, resulted in the diagnosis of a panic disorder (F 41.0) which was communicated to the patient. Apart from assessment of thyroid stimulating hormone (TSH), echocardiography and exercise testing, no other technical investigations were carried out. Parallel to the technical diagnostics, the patient was informed via booklet and video on the symptoms and treatment of panic disorder. In two psychotherapeutic sessions (20 minutes each), a biopsychosocial model of the symptoms of the patients based on his biography and current living situation was outlined and motivation for psychotherapy was established. After three days of hospital stay, the patient was discharged after a consultation date with a psychiatrist for the next day had been scheduled. The case was grouped into the DRG U 67Z with an average length of stay of 11.9 days (high trimming point 11.9 days, low trimming point 2 days) and a cost weight of 0.611.

Case 2: After consultation with her psychotherapist, the family doctor admitted to the hospital an 18 years old female patient diagnosed with suffering from restrictive anorexia (F 50.0) since three years due to a weight loss of 3 kg during the last two weeks and increasing fatigue. The patient had not been able to visit school during the last two weeks. The psychotherapy had been stopped for four weeks since the patient had fallen short of the limit < 15 body mass index (BMI) which had been set as the minimum BMI for outpatient psychotherapeutic treatment. The BMI on admission was 14.1. In a first interview which was conducted with the patient and her parents, the treatment approach of behavioral nutritional therapy was explained and family diagnostics were carried out. During the interview, the hypothesis was established that the current weight loss stabilized the family homeostasis. Five psychotherapeutic sessions (30 minutes each) were conducted with the patient to elaborate and modify eating associated attitudes and feelings. After meals, the patient did CD-supported relaxation and imagination training. The hypothesis of the family dynamics was discussed by telephone with the psychotherapist and an additional systemic family therapy recommended. Apart from routine laboratory testing and ECG, no other technical investigations were performed. The patient was discharged after 14 days with a BMI of 15.2. The case was grouped into the DRG 66Z with an average length of stay of 11.6 days and a cost weight of 0.687.

Case 3: The 44 years old female patient was transferred from ward C after a psychosomatic consultation. Crohn’s disease had been diagnosed 15 years before and an ileostoma had been applied after proctocolectomy due to refractory colitis eight years ago. The patient had been admitted to hospital because of constant severe abdominal pain in the right middle abdomen for four weeks. The patient had been bedridden for two weeks. Routine laboratory testing showed no abnormalities. An abdominal abscess was excluded by computed tomography. Via ileoscopy and histology, a slight ileitis was diagnosed. Despite therapy with 60 mg prednisolon and additional therapy with a weak opioid, the patient reported no relief of her pain and disabilities. The psychosomatic interview
Discussion

In every field of medicine with the (preliminary) exemption of psychiatry and psychotherapeutic medicine, the implementation of the G-DRG system examines whether the respective resource consumption is adequately represented in the G-DRGs and whether the respective working approach is profitable for the hospital management. In this study, the calculation sample of the MDC 19 (mental disorders) of the G-DRG version 1.0 was analyzed and its diagnoses, procedures and costs compared to those from a psychosomatic division in a department of general internal medicine. Our analysis and hypothesical calculation comparing the costs and proceeds of one psychosomatic division demonstrated that an internal psychosomatic treatment is partially represent-ed in the G-DRG version 1.0 and version 2004 and that it is economically profitable. Some limitations of the study must be considered:

• The results of this unicenter study have to be assessed through a multicenter study from other internal psychoso-
matic departments. In doing so, the assumption of the working group of the German Psychosomatic Scientific Societies of a lack of economic homogeneity within the DRGs of the MDC 19 [14] can be tested.

• We conducted a hypothetical calculation with a base rate of € 2,900. The actual base rate of the G-DRG-system has not yet been set and might be below € 2,900. To meet the costs of the year 2002 in our psychosomatic division, a minimum base rate of € 1,930 would have been necessary.

• Although a sufficient number of patients with main diagnoses of the category F (mental disorders) of ICD 10 were included in the calculation sample of the G-DRG version 1.0, psychotherapeutic procedures were not or only rarely performed with the appropriate coding in these patients [10]. The resource consumption was mainly related to technical diagnostics. Because psychotherapeutic procedures do not increase the proceeds, either in the G-DRG version 1.0 or in the version 2004, there is a risk of substantial underpayment of psychotherapeutic pro-
cedures. The higher costs due to human equipment (with the possibility of carrying out psychosomatic interviews) in our division compared to the hospitals of the calculation sample is counterbalanced by lower costs of technical diagnostics and non-medical infrastructure in our division.

• The analysis of the resource consumption within a distinctive DRG allowing a more detailed comparison of hospitals is not possible because data of individual pa-
tients regarding their resource consumption have not been provided by the management boards of the hospitals to date.

Despite these limitations, some hope remains that intern-
al psychosomatic therapy is and will be possible within the G-DRG system. Some aims of integrated departments, such as the development of interdisciplinary treatment strategies surpassing the rigid borders of in- and outpatient medical therapy in the German health system, agree with the principles of the DRGs [3]. Yet, ongoing efforts of hospitals and scientific societies are necessary to realize the chances for psychosomatic medicine in the G-DRG system [3], [15]. The G-DRG system is designed as a self-evolving system. Every year, suggestions regarding modifications to the DRGs can be forwarded to the German DRG-institute (INEK), and suggestions regarding modifications of diagnoses and procedures to the German Institute of Documentation and Informatics (DIMDI), following a structured system of proposals. Thus, the calculation sample of the G-DRG version 2004 with 137 hospitals including 13 university hospitals has been larger than the one of version 1.0 with 125 hospitals excluding university hospitals and resulting in higher cost weights in some DRGs of MDC 19 [14]. The code list of operations and procedures, OPS version 2004 [16], includes more (optional) psychotherapeutic procedures allowing a more detailed coding of psychosomatic outputs delivered by psychosomatic CL-services or internal psychosomatic divisions. Internal and psychosomatic societies should provide INEK with clinical and economic data from several hospitals to secure the elevation of cost weights of "somatic" DRGs relating to psychiatric comorbidity and psychosomatic care delivered. A separate procedure of complex internal psychosomatic diagnostics and therapy should also be applied for DIMDI. Psychoso-
matic scientific organizations should not only engage in the integration into the G-DRG system of psychosomatic and psychotherapeutic complex therapy delivered by de-
partments of psychosomatic medicine and psychotherapy, but also in the maintenance and development of psychosomatic-psychiatric CL-services and internal-
psychosomatic divisions in general hospitals [6].
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