Diagnostic variability in a cohort of patients with multiple admissions in the last two decades

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Variabilidad en los diagnósticos de una cohorte de reingresadores en las dos últimas décadas

Summary

Objective. *To investigate possible changes in the admission pattern correlated with improvement in psychiatric attention and if there is variability in the diagnosis of patients previously identified as having multiple admissions during the study period.*

Material and methods. *Our study is based on fifty-nine patients who were admitted on at least ten occasions between 1983-2000. The medical records of the frequent users were reviewed and data were extracted on several variables: principal psychiatric diagnosis (DSM-IV TR criteria) and diagnostic changes as main variables and period, admissions density, admission interval and period between last admission and the end of study, as related variables. Statistical analyses: Friedman's variance non-parametric analysis for related samples, Pearson's chi-squared test and sequence graphing.*

Results and discussion. *Improved psychiatric care in our city would seem to correlate with the decreasing number of patients with multiple admissions to the point where there have been no admissions in the past year. Diagnosis (DSM-IV axis I and II) variables showed important variations from one admissions to the next. The psychosocial and adaptation problems that became manifest during the successive admissions tended to improve over time as did the overall functioning of the patients. Our findings suggest that this population is composed of three distinct subgroups. Identification of the subgroups may have important implications for the management and treatment modality.*

Key words: *Revolving-door patients. Epidemiology. Readmissions.*

Resumen

Objetivo. *Investigar posibles cambios en el patrón de ingresos en relación con mejoras en la asistencia psiquiátrica y si existe variabilidad en los diagnósticos en un grupo de pacientes reingresadores durante su período de seguimiento.*

Material y métodos. *Del total de pacientes psiquiátricos hospitalizados entre 1983-2000 se selecciona un grupo de 59 que ingresaron al menos 10 veces. Revisando las historias clínicas analizamos las siguientes variables: diagnóstico psiquiátrico principal (basándonos en el sistema DSM-IV) y cambio diagnóstico como principales y período, densidad de ingresos, intervalo sin ingresos y cierre como variables derivadas. Pruebas estadísticas: análisis no paramétrico de la varianza de Friedman para muestras relacionadas, Chi² de Pearson y graficación de secuencias.*

Resultados y discusión. *La mejoría progresiva de la asistencia psiquiátrica en la provincia probablemente explicaría la disminución del número de pacientes reingresadores hasta su desaparición en el último año. Las variables relacionadas con diagnósticos en los ejes I y II (DSM-IV) presentan variaciones importantes en los sucesivos ingresos. Los problemas psicosociales y ambientales se acumularían a lo largo de los ingresos y el nivel de actividad global tendería a mejorar en función de los años que se lleve ingresando. Encontramos que esta población de pacientes se componía de tres subgrupos susceptibles de un abordaje terapéutico diferente.*

Palabras clave: *Pacientes de «puerta giratoria». Epidemiología. Readmisión.*

INTRODUCTION

In previous studies on patients with multiple admissions, we analyzed some characteristics of this group, based on its description and on the study of the relationships presented among the variables[1,2]. Both in the descriptive study as well as in the relational one, the data were analyzed statistically, with a cross-over cutoff that used the first admission as index episode as a reference, and then, in the same cutoff, some variables-summary that abridged information of all their hospitalizations were added.

In the literature, the approaches to the fact of multiple re-admissions used dissimilar methodology, with different perspectives and finalities and there are no unanimous criteria when considering a patient as a revolving door one. Most of the studies eliminated the «long term» revolving door patients, that is, those whose admissions

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occurred slowly, over the years, since they performed a crossover cutoff of this population or followed them up during a limited period of time. In this study, as the observation period available is long, we have been able to obtain these and to investigate if there are subgroups within the revolving door patients.

There are authors[3-5] who believe that there is a greater likelihood that the need for short and repeated admissions will decrease for some patients when the psychiatric health care system is better organized. In this regards, it must be mentioned that in our province, there have been some milestones in psychiatric health care, that include this observation period, that may have influenced the decrease in admissions of some patients. We refer to the creation of mental health care teams in the district after the year 1986, to the unification of the acute hospitalization units of the Delegation and Public Health Care System in the year 1995, and to the greater availability of the rehabilitation units after 1998-1999.

We pose three basic questions in this study: if the organization of psychiatric health care in our province in recent years (acute hospitalization unit, mental health care unit, rehabilitation units) had modified the general pattern of admissions/readmissions; if there had been important changes in regards to diagnoses in successive admissions; and finally, to know if the group of revolving door patients was uniform, or if, on the contrary, there were characteristics that made it possible to differentiate subgroups within this cohort.

MATERIAL AND METHODS

The sample of patients with multiple admissions is made up of a group of 59 patients (19 men and 40 women), whose ages ranged from 17 to 76 years (mean 34.6), who were admitted at least 10 times in a period of 18 years and who were chosen among the total number of patients who were admitted at some time in the hospitalization unit of the Psychiatry Service of the Public Health Care System of Burgos. The study would be equivalent to a retrospective longitudinal study of a cohort of patients whose elements are incorporated over the years when the requirement of gathering 10 admissions is fulfilled. In the case of the patients who have more than 10 admissions, the evolutive history is limited to the first ten.

To solve the first question posed, we made a table of the new admissions and re-admissions in our service, that made it possible to make a chart and thus assess to what degree the organization of the psychiatric care influenced the admissions pattern.

To study possible diagnostic changes during the successive admissions, we have observed the behavior of two types of variables: the variable *diagnostic change* (without diagnostic change/minimum change/significant change, non-related diagnoses); and the variable *principal diagnosis by groups.* We have updated the diagnoses according to the DSM IV classification system: axis I (principal diagnosis and comorbidity), axis II (existence or not of personality disorder), we omitted axis III (existence of physical conditions), axis IV (existence of psychosocial or environmental problems) and axis V (GAF on admission). In the variable *principal diagnosis by groups,* we have distinguished the following categories: 1) organic mental disorders and disorders due to substance use (OMD/DSU); 2) psychosis; 3) affective disorders (Bipolar disorder and major depression); and 4) others, in which dysthymia, anxiety, eating behavior disorders (EBD), adaptive disorder and others are included. To detect if there are statistically significant differences between the successive measurements of the quantitative variables during the admissions, we have used the non-parametric test of Friedman (chi^2 distribution with K-1 degrees of freedom, K being the number of variables related; in our case 10), assuming that we were checking related k variables (the scores of a sample in ten different moments) for each variable studied. For the qualitative variables, we used the Pearson chi^2 test. For all the calculations, we used the statistical program SPSSv.6.1.2. and the accompanying explanatory texts of Marija J. Norusis[6,7].

In order to distinguish subgroups within the «revolving door patients», we studied the admissions patterns case by case using the sequential charts that they originated and we used the time variables derived: *period* (n.° of years to complete the admissions), *density of admissions* (n.° of admissions/period), *interval without admissions* (n.° of years in which no admissions were produced/period) and *closure* (years that passed from the last admission of the patient until the end of the study).

RESULTS

In figure 1 we observe the global evolution of new admissions and readmissions in the Psychiatry Service in the years studied. Considering the total number of admissions, three phases are distinguished. A first one (1983-1988), in which the growth of the Psychiatry unit

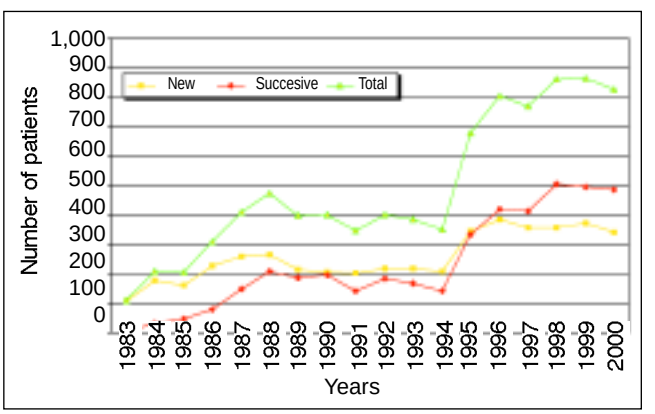

Fig. 1. Psychiatric admissions vs readmissions. Years 1983-2000 (n = 8,797). New (4,618)/succesive (4,179).

is manifested: training, allocation of 8 beds at first together with other services, posterior allocation of a floor with 16 beds. A second phase (1989-1994) of stabilization and mild decrease in number of admissions, that coincides with the creation and full functioning of the district mental health teams and out-patient clinics. And a third one (after 1995) in which the hospitalization services of the Public Health Care System and the Delegation are unified, with the corresponding sudden increase and posterior tendency to stabilization. The line of *successive re-admissions,* in general, leads to the same inflections. However, if we break down the number of new admissions, there is a continual tendency to increase.

On the other hand, in figure 2, we observe the evolution of the series studied of patients with multiple admissions. The lines corresponding to the *total admissions* and to *successive readmissions* is somewhat similar to that of global admissions and readmissions, the cases of multiple admissions increasing as the global cases seen do so, marking the same type of inflections corresponding to the history of the service. They only fall more suddenly at the end, observing, however, a clear difference when only the line that represents the new cases of persons with multiple admissions is considered, which, after the expectable growth, experiences a progressive decrease over the years, a recovery of limited relevance in 1995, when the services are unified, and a frank decrease until disappearance in the last two years studied, on the contrary to what occurs with the number of global new admissions that is always decreasing.

In tables 1 and 2, we summarize the evolution experienced by the variables diagnosed over the 10 successive admissions. We consider the variability of the principal diagnosis on axis I over the admissions important (table 2). Analyzing it by groups, we find that the OMD/DSU presented percentages that ranged from 8.3% to 15% of the sample in the first 10 admissions, beginning in the first admission with the same percentage as in the tenth, this being minimum in admission number 9 and maximum in number 8, but it was not possible to determine any specific tendency during them. The psychosis group

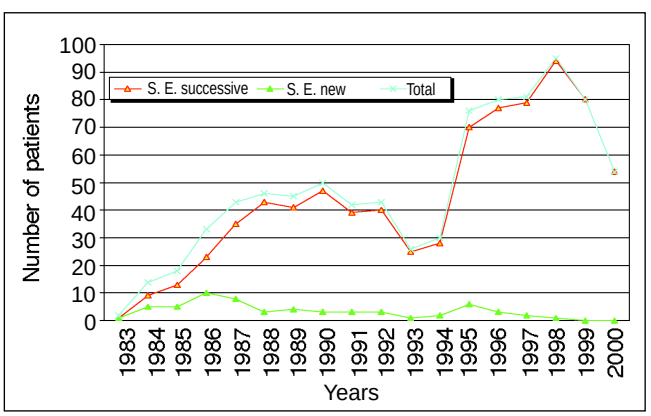

Fig. 2. Patients with multiples admissions (≥ 10). Years 1983–2000. New (59)/successive (730).

TABLE 1. Evolution of the variable axis II, axis IV and axis V

N.° of admission	*Axis II (% with dx)*	*Axis IV (% with dx)*	*Axis V (GAF)*
1	40.7	55.9	17.0
2	42.4	57.6	22.6
3	40.7	54.2	20.2
4	39.0	57.6	25.7
5	30.5	45.8	30.8
6	30.5	54.2	31.8
7	32.2	57.6	33.4
8	36.2	65.5	34.1
9	35.6	62.7	35.0
10	39.0	67.8	36.6
Total admissions	40.2	60.6	31.8
Differences	ns	ns	F = 114.30* p = 0.0000

* F = Chi^2 of Friedmans two way non-parametric ANOVA.

presented proportions that ranged from 20.3% to 30%, beginning with 26.7% in the first admission and ending with 30% in the tenth, this being minimum in the eight and maximum in the third, fourth and tenth. The affective disorders group ranged from 38.3% to 46.7%, and the admission in which the maximum and minimum occurred were equally unpredictable. Something similar occurred with the disorders classified as «others», that ranged from 13.3% to 20% over the first ten admissions. The differences compared by Chi^2 (Pearson) are not significant.

The percentage of persons diagnosed of personality disorder also varies, beginning and ending with similar percentages. There are higher percentages in the first admissions, there is a significant decrease in the middle ones and this increases again in the last ones. The differences (Chi^2) are not significant. Psychosocial and environmental problems seem to increase as more admissions occur. Except for a sudden decrease in the fifth admission, the percentages remain similar in the first six

TABLE 2. Evolution of the groups principal diagnostic variable of axis I

No. of admissions	*OMD/DSU (%)*	*Psychosis (%)*	*Affective (%)*	*Others (%)*
1	10.0	26.7	45.0	18.3
2	10.0	28.3	45.0	16.7
3	12.7	30.0	38.3	20.0
4	13.3	30.0	40.0	16.7
5	11.7	26.6	46.7	15.0
6	10.0	25.0	45.0	20.0
7	13.3	26.7	43.3	16.7
8	15.0	20.3	43.4	13.3
9	8.3	28.4	45.0	18.3
10	10.0	30.0	43.3	16.7
Total admissions	11.4	27.2	43.5	17.2
Non-significant differences				

admissions and experience an important increase in the last three. The differences (Chi^2) are not significant.

In the global assessment of function scale (GAF), the level is minimum in the first admissions and there is a clear tendency to increase in successive admissions, going from the second to the fourth section. The differences are significant (Friedman $Chi^2 = 114.30$; $p = 0.0000$).

Finally, we study the admission patterns case by case with the sequential charts they gave rise to, trying to distinguish characteristics of groups of patient (density of admissions, intervals in which they are not admitted, regularity in the distribution over time) that would explain why some complete the admissions in a few years and disappear and other have more spaced admissions and over many years.

Among those who use few years[3-5], «neurotic» diagnosis (borderline personality disorder, histrionic, dysthymia, factitious) seem to predominate, however there was also some representative of schizophrenias, major depressions and one OMD.

Among those who used 6-7 years, schizophrenias and bipolar disorders clearly predominate, although there was also a borderline personality disorder and major depression. Even among the following group (8-10 years), psychosis and affective disorders seem to continue to predominate, but diagnoses of the group «others» and OMD/DSU are also intermingled, so that, considering the prevalence of these in the sample, it is not possible to reach any conclusion that has statistical significance. The only case that was present during the 18 years was a bipolar disorder and a patient who used 17 years and some of those of the 15 and 16 years group also had this diagnosis.

Besides stating these separate facts, when we attempt to group the admission patterns as intuitively as possible, we obtain the period C category variable already explained in previous studies. As was stated in them and in its relationships with the diagnostic change, this variable revealed that there were many more diagnostic changes in the group that used between 13 and 18 years of admissions and we obtained the meaning of such relationships in its relationships with the global activity: the group with many more years of admissions[13-18] was that which had the worst global functioning. Equally, in its relationship with closure (years without admission from the last discharge), it showed us that the first group, which used fewer years, had not been admitted for a longer time. Thus, considering the descriptive and relational characteristics of the previous studies and the evolutive ones of this, we can obviously distinguish three types of revolving door patients to whom we assign the following characteristics (table 3):

— *Type 1.* These are patients who use few years[3-7] to complete their admissions. Thus, they have a high density of them (mean of 2.6 admissions/year); an interval without admissions that is almost nonexistent, which means that they are admitted practically every year at least once; very little diagnostic changes over their admissions; a global activity in the index episode that is less affected (mean of 26) and they have much more time without being admitted after the final discharge (approximately 3 years). They present more diagnoses of eating behavior disorder (EBD), OMD and bipolar disorder than expected .

— *Type 2.* They use between 8 and 12 years to complete their admissions. Their density is about half that of the previous group (mean of 1.3 admissions per year); greater distance between admissions; they produce more diagnostic changes than in type 1, but they belong to those who are labeled as «minimum». Their global activity is a little more affected than in the first group (mean of 15) and they have less time without admission after the last discharge (mean of 1.9 years). The most represented diagnoses are typical and atypical psychoses and they produce more diagnostic changes than in type 1, however they are considered as minimum changes within the diagnostic group considered.

— *Type 3.* They use many years[13-18] to complete their admissions. Their density is less than in the two previous groups (approximate mean of one admission per year); they have a little higher interval without admissions; in them, there are many and important diagnostic changes over the admissions; there global activity is very affected in the index episode (mean of 4) and they have little time without admission since the last discharge (0.5 years). As diagnoses, we find a predominance of neurotic and personality disorders.

TABLE 3. Types of patients with multiple admissions

	Type 1	*Type 2*	*Type 3*
Period (years being admitted)	3-7 (mean: 5)	8-12 (mean: 10)	13-18 (mean: 15)
Density (no. admissions/ period)	2.55	1.3	0.89
Interval (years absence/ period)	0.03	0.35	0.45
Closure (years since last admission)	2.52	2.33	0.48
Diagnosis axis I	EBD, OMD, bipolares	Typical, atypical psychosis	Neurotic, personality disorder
Diagnostic changes	Negligible	Minimum	Important

DISCUSSION

Following the evolution of the admissions in our service during the years studied, the influence of the periods commented on is observed on its establishment, consolidation, maintenance, later combination with the Delegation, with a significant increase of patients and new stabilization. Our small group of multiple revolving

door patients seems to follow the same vicissitudes in regards to the global number of successive admissions. However, when the new components are broken down, we clearly see that the increase is not as notorious as in the remaining admissions in the year 1995, when the services were combined, and that there is even a tendency after this for them to decrease until the disappearance of new admissions in the last two years. Once the number of patients being admitted has gained importance over time, it would not be expected that this would decrease; it would have a certain inertia. New elements would substitute others that cause withdrawals and with the growth experienced globally, we would suspect that its area would also grow. Unless there are changes in the care given by the organization, we suppose that there will be more and more care given to the mental patient. If we observe figure 2, there were never so many new multiple revolving door patients as in the year 1986, when the Psychiatry Unit of the Hospital General Yagüe was growing, the mental health care teams were not functioning and there was no connection at all with the services of chronic patients, circumstances, thus, which are ideal to favor the «revolving door» phenomenon.

In the later years, these deficiencies improve and the number of new patients with multiple admissions tends to decrease and there is even some year without any new patient with readmission. The explanation of the facts occurring since 1995 probably is found because, when the services were unified, we find a group of patients with multiple admissions who were the same in both services, and thus, the increase was less than expected (minimum increase of this type of patients in 1995 in relationship with the important increase of the global volume of patients). On the other hand, the tendency to continue decreasing until its disappearance in recent years could be related with the opening of rehabilitation units, such as the Hospital of Fuente Bermeja and others, which, in spite of the difficult access, could have received some of the patients with multiple admissions, for example some chronic psychotic patients who, integrated in these middle-long stay units, were no longer admitted to the acute units so often. In relationship with the feeling of some authors[3-5], and regardless of the diseases presented by these patients, as the psychiatric care system improves its organization, it can be expected that the need for short and repeated admissions will decrease for some patients.

The variability of the *principal diagnosis in axis I* over the admissions is important (although the differences are not significant with simple tests of statistical contrast). It seems that the greater the number of years of the admissions, the greater the variability[2]; that some diagnoses, such as the group of neurotic disorders, were more prone to experience changes over the admissions; and that these changes were also more frequent among those who had a diagnosis of personality disorder. Furthermore, we mention the greater probability of being seen by different psychiatrists (each one with a special way of diagnosing) as the number of admissions and the period of time increase. Thus, we cannot look for a simple explanation for these facts, as has been insinuated by some authors[9,10], on what could influence the previously mentioned circumstances. The percentage of subjects who are diagnosed of personality disorder also varies, there being higher percentages in the first admissions (40%-42%), this decreasing up to 30% in the intermediate ones with an increase in the last ones (35%-39%). We could also think that a diagnosis of personality disorder would be less probable in the first admissions: the patient is known less, we resist labeling the patient more, etc. We would believe that the axis II diagnosis could increase afterwards, in view of, for example, a worse evolution, of some worse results, that we would attribute the fact that some personality factor would have been involved in the picture, and we would have no doubts that these diagnoses should increase in the last admission. But this did not occur in our data. The possible transfer of diagnoses over time (for example, personality disorder-psychosis spoken about by Kastrup in the studies mentioned) should be observed in some of the groups, which, in contrast, would have the contrary curve, but we also did not discover this. Thus, we have more unpredictable interpretations. There could be a lack of allocation of the information, an excess of familiarity with the patient's disease that would mean neglecting the personality disorder diagnosis; the diagnosis of axis II may not be relevant in some admission due to a disease that is more defined in axis I, etc. Psychosocial and environment problems increase as there are more admissions. Except for a notorious decrease in the fifth admission the percentages remain similar in the first six and experience an important increase in the last three. Thus, in addition to there being a greater number of psychosocial and environment problems in this sample of patients with multiple admissions in the index episode, they also increase over the successive admissions. We have already insinuated the factors that it could be related to in the discussion of the descriptive study, however it seems to be verified that the longer the time that has passed for this sample, the more complicated it becomes from this point of view and problems already derived from the disease process itself, etc. could be added. The level of the global activity is minimum in the first admissions and tends to increase in successive admissions, going from the second to fourth section of the GAF. We have already commented on the deceptive sense of this correlation in the relational study. On the one hand, the global activity positively related with the number of admission (regardless of the time used in them), however, on the other hand, it did so negatively with the number of years that the person remained hospitalized. The deterioration caused on this activity would be conditioned by the years of evolution of the process in question.

Completing the information with the sequential chart study of the admission patterns and the resulting ordering in types I, II and III, we could suspect that, from an evolutive point of view, there are disorders that are

expressed with different seriousness and prognosis, regardless of their diagnosis; that a dysthymia as well as schizophrenia, depression or alcohol dependence (perhaps some clarification could be made in regards to prevalences) could become as mixed, chronic or deteriorating (and thus needing care); that when we speak about multiple admissions of patients, we are probably not referring to nosological entities but rather to their seriousness, chronicity and prognosis and that perhaps it is these aspects, and not the diagnosis, which will decide the hospital admissions (more expense care) that these patients are going to need.

All of these characteristics show us that the patients with multiple admissions seem to follow certain incidences occurring in the psychiatric care in our province, with a progressively high degree of complexity and that the principal diagnoses on axis I present variations over the admissions, the psychotic disorders being those that have a greater consistency.

In addition to the above, three types of patients with readmissions that would be defined by the different value of the time variables derived (period, density, interval and closure) and a series of accompanying clinical characteristics could be distinguished, confirming that they are not a homogeneous cohort but rather that the different differentiable subgroups would benefit from a different therapeutic management (acute hospitalization units for those of type I and rehabilitation centers and mean and long term stay units for type 3).

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