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Impact of Mental Illnesses Treatment During the Period 1950-2020. Analysis of A Single Mental Institution, Buenos Aires, Argentina

Gustavo H. Marin[1,2*], Lucia Giangreco[1], Lupe Marin[1,3], Emilia Valdez[1], Melina Heig[1], Blas Kersich[1], and Gina Marin[1]

[1]*Pharmacology Dpt. National Faculty of Medical Science, National University of La Plata, Argentina.*

[2]*National Scientific and Technical Research Council, CCT-La Plata CONICET.*

[3]*CIC- Scientific Research Commission, Buenos Aires, Argentina.*

***Correspondence:**
Dr. Gustavo H. Marin, Pharmacology Department, National University of La Plata, Argentina, Tel: +54 221 4216932.

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ABSTRACT

Introduction: *Mental health treatment has varied in the last century; however, the impact of these new therapeutical options is little-known.*

Objectives*: To evaluate the impact of treatments for mental health diseases along the last decades.*

Methodology: *retrospective, descriptive case-report study. Medical records of patients admitted to a Mental Health Institution in Buenos Aires, Argentina were evaluated over 7 decades. Variables analyzed were: age, sex, diagnosis, time of hospital stay, number of re-hospitalizations, drugs available per decade, cost of drug, cost of hospitalizations.*

Results: *Hospitalization average lenght of stay was 6.33 months, with 3.18 readmissions per patient. In the 21st century it was detected a reduction in the length of hospitalization (4.66 months) and an increase in the number of hospitalizations (4.3 hospitalizations/patient). The number of drugs prescribed was 5.14 per patient (1.6 in the 1950s and 7.22 in the last decade). During 1950s, the most prescribed drugs were lithium and chlorpromazine, in the '60s haloperidol; in the '70s benzodiazepines, haloperidol, and amitriptyline; in the '80s and '90s fluoxetine, sertraline, and BZD; from the 2000s paroxetine, risperidone, and pregabalin were added to the earlier drugs; and in the current decade new antipsychotics (olanzapine, ziprasidone, quetiapine or lurasidone), antiepileptics (lamotrigine) were included. Although diagnoses were maintained over time (schizophrenia, psychosis, bipolar disorder, dementia, depression) in the last decade, 27.7% of the hospitalized patients had dual pathology (addiction+other mental illness). Cost of drugs prescribed increased >9 times, while the cost of hospitalization increased >4 times in the last decade compared to the second half of the 20th century.*

Conclusion*: Although new drugs to treat severe mental disorders reduced side effects associate to treatment, its efficacy did not improve neither the duration of the hospital stay nor in the number of re-hospitalizations along the past 70 years; while cost of new drugs increased 9 times.*

Keywords

Mental, Health, Treatment, Drugs, Hospitalization.

Introduction

Mental illness has once been considered in the past stages of human civilization, as conditions associated with mystical causes hence, rituals based on religion and superstition resorts were accepted methods to treat these diseases [1]. Socrates, Hipocrates, and Galeno for instance, believed in four essential elements that controlled human behavior blood, bile, black bile, and phlegm. This belief persisted through the middle ages and conducted doctor's practices in order to equilíbrate those four humors.

The belief that mental alteration was a choice of individuals associated with their abnormal behavior, led doctors to use physical restrictions such as straitjackets or punishments as treatments to try to restore the balance of "the 4 humors" [1].

Mental illness were for centuries seen as a source of shame, concealment, and social stigma for families with members affected by this type of disease. Because of this reason, religion also played a key role in mental treatment where priests' duty replaced medical care isolating mentally ill people in churches and monasteries.

These ideas continued until the year 1800 when French and English doctors adopted the concept of "moral treatment" in the care of these patients, based on isolation, rewards and punishments actions against disruptive behavior [2].

In the early 20th century, contemporary doctors strongly disagree with these thoughts and adopted new ideas in order to substitute the type of care proposed for these patients. One of the leading figures of that siecle was Sigmund Freud, which developed the theory of psychoanalysis, installing practices that encouraged patients to talk about their problems in order to open a door to their unconscious mind and repressed thoughts that were considered the root of the mental instability [2].

On the order hand, Freud's detractors found in the biological model, the explanation of many mental illness. They stand that mental health problems were caused by biochemical imbalances proposing psychosurgery or electroconvulsive therapy to treat mental health imbalances.

These beliefs also opened the door to psychopharmacology options. In this area, drugs like chloral hydrate, bromides, barbiturates and specially lithium proved to be effective in controlling the symptoms of many mental problems [3].

In the following decades of 20th century other drugs like chlorpromazine, diazepam or fluoxetine became the most prescribed drugs for certain mental disorders.

In this 21st century, brand new drugs were developped and are now available in the pharmaceutical market. It is a fact that rather than replacements, these new pharmacological options are constantly added to the old therapeutical arsenal in order to treat currently mental disorders.

For all these reasons, mental illness treatment over the centuries, reflexs the complexity of the therapy adopted by health systems along the history. The challenge is to know if these changes have had a positive impact on these patients.

To contribute to clarify this topic, the present study was carried out, namely, in order to determine whether the changes in pharmacological therapy that have occurred over the last decades have had a positive impact on the health of patients with mental disorders.

Patients and Methods

Type of Study

This is a retrospective-descriptive study with an analytical stage in which clinical histories of patients admitted to the Mental Health Institution of Buenos Aires during the last 70 years were evaluated.

Study Period

01/01/1950 to 01/31/2020

Information Source

Primary source based on the Clinical Histories of patient hospitalization in a Mental Institution of Private Management of the City of La Plata, Buenos Aires, Argentina. The medical records of each decade were selected by simple random probability sampling, stratifying the sample according to each of the decades included in the study (from 1950 to 2020). The sample size was 30 medical records for each 10-year period.

Tools for Data Collection

Database created especially for the study.

Variables

The variables analyzed in this study were: age, sex, diagnosis, average stay in hospital, number and reason for re-hospitalizations, quantity and type of medications prescribed and administered per decade, results obtained in terms of clinical improvement of patients treated, side effects associated to treatment, cost related to the drugs administered and overall cost for each hospitalization in each decade (taken at current costs adjusted current values with inflation data). Cost of the medicines was considered as defined by the daily dose (DDD) for each patient treated.

Statistical analysis

The statistical analysis was performed with the EPI INFO 7.0 statistical software, each variable was coded for the programme management, with its description and its categories. This programme allows expressing the results in frequency and percentage of each study variable.

Ethical aspects

This work was carried out according to international standards for biomedical research in human beings proposed by the Scientific Reasearch Commission (CIC Nº02-18).

Results

Two hundred and ten medical records were included in the analysis (52.8% were females and 47.2% were males). The average age of the patient's record enrolled in the study was 60.6 ± 8.1 years.

The type of mental health pathologies that needed hospitalization were evaluated along the different decades. The overall prevalence of these diagnoses remained stable over time: schizophrenia (14.47%), psychosis (23.68%), bipolar disorder (13.15%), dementia and depression (10.52%), among other pathologies. It should be noted that in the last decade analyzed, in 27.7% of the

cases, diagnoses at hospital admission were associated with an addiction (dual pathology)

It was established that the average length of hospital stay was 6.33±3.4 months, with a mean number of 3.18±1.9 re-hospitalizations in each patient. Starting in the 21st century, there was a reduction in patient's age (55.21 ± 9.3 years); in length of hospitalization time (4.66±2.7 months). It was also seen an increase in the number of re-hospitalizations (4.3±2.2 re-hospitalizations / patient).

The average number of drugs administrated was 5.14 ± 2.3 / patient (1.6 ± 0.9 in the 1950s and 7.22 ± 3.9 today).

The therapeutic impact achieved with the treatment provided in each decade was also determined in terms of pre-established indicators such as the average in-patient stay measured in months, number of re-hospitalizations and the degree of clinical improvement achieved. We also registered all treatments administered, focusing on the number and type of drugs prescribed per decade and the costs associated with these pharmacological therapies administrated. These results showed that during the 1950s, the most prescribed drugs were lithium and chlorpromazine, in the 1960s haloperidol; in the '70s benzodiazepines (BZD), haloperidol, in the '80s amitriptyline was added; in the '90s fluoxetine, sertraline, haloperidol and BZD; in 2000, risperidone, paroxetine and pregabalin were added; and from 2010 to 2020, new antipsychotics (olanzapine, ziprasidone, quetiapine or lurasidone), antiepileptics (lamotrigine) were incorporated to the therapeutical options (Figure 1).

Regarding adverse effects, these events were recorded for each decade in a global way (including extrapyramidal signs, arterial hypotension, electrocardiographic alterations, laboratory changes, weight gain, or discontinuation of treatment) detecting a slight decrease, although without being statistically significant, in the last two decades (76.6% of the patients in the '50s; 73.3% in the '60s, and '70s, 70.0% in the 80s, 66.6% in the '90s; 63.3% in 2000 and in 2010).

In relation to costs, an adjustment of each price to current value was performed. It was observed an increase in more than 9 times the cost associated drug's prices during hospitalization along the decades (Figure 2), and also an increase in 4 times the cost of hospitalization in the last decade compared to the 21th century (Figure 3).

Discussion

Mental diseases are identified and described in the "Diagnostic and Statistical Manual of Mental Disorders" (DSM). At least 15 new diagnoses were included in this DSM Manual during the last two decades.

Current times have pushed us to medicalize some aspects of our life to the point that "Internet gaming disorder" is now part a clinical diagnosis included in the list of mental diseases registered in the DSM.

However, those severe mental health disorders that need hospitalization remained quite stable over decades as we demonstrated in this study. Perhaps some diagnostic criteria have been modified, but the pathologies basically stand without changes. Noteworthly, it should be noted that in the last decades dual pathology increased, that is, an addiction (to illicit or licit drugs) accompanies the classical diseases that required hospital admission.

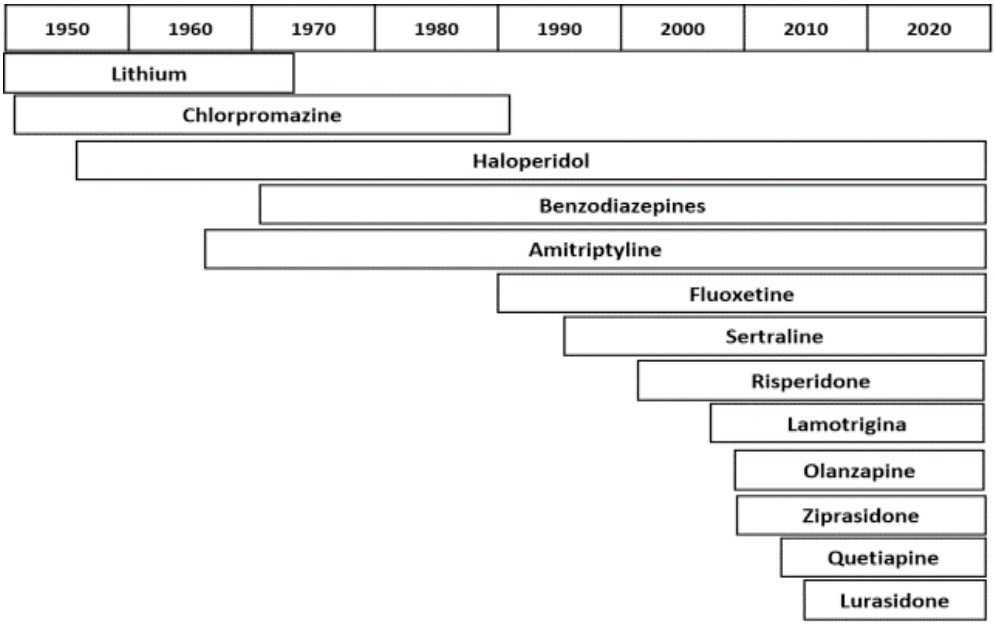
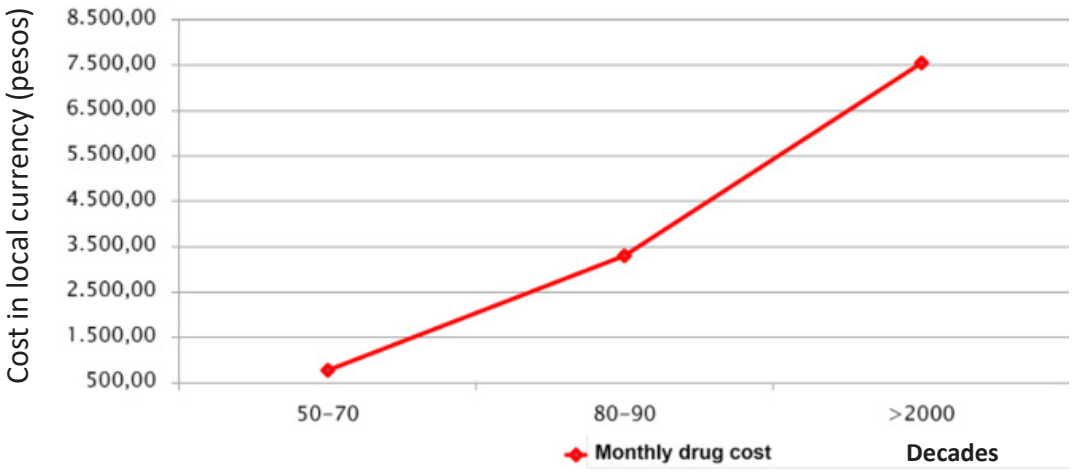
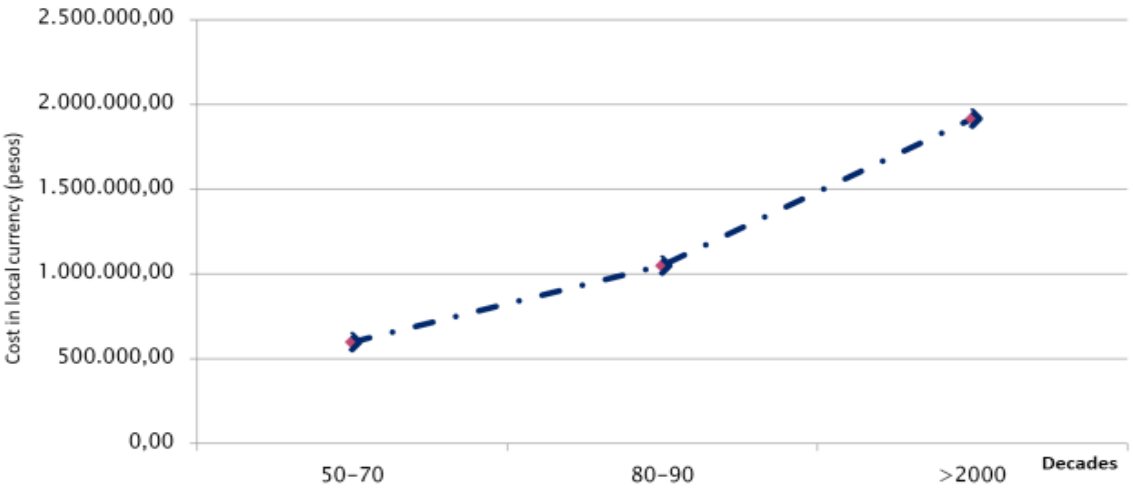


Figure 1: Drugs used during hospitalization over the decades according to order of appearance.



In local currency values updated and adjusted for inflation at the time of starting the study

Figure 2: Cost associated to pharmacological treatment drugs over the last decades.



Hospitalization costs referred to care (without drug treatment), measured in local currency values updated and adjusted for inflation at the time of starting the study

Figure 3: Hospital monetary charges (excluding pharmacological treatment).

On the other hand, the use of drugs mental health problems treatment varied from 1950 to 2020. It is interesting to remark that novel drugs presented in the pharmaceutical market are later installed as valid therapeutic options for mental illnesses in doctor's cabinets, however that new option did not replace previous treatments but rather add to the old therapeutic arsenal.

Lithium was one of the first drugs widely used to treat psychiatric patients with acute mania or affective psychosis [4]. Later, the appearance of chlorpromazine did not provide differences with lithium to control typical manic symptoms [5], nor did benzodiazepines [6] to achieve behaviour modifications, but all these pharmacological groups remained available as ancient alternatives at the same time.

The scientific research in the 60's contributed with a better understanding of mental disease and added antipsychotic drugs like haloperidol which affects the dopaminergic system as chlorpromazine did, having both medicines a potential role in diseases such as schizophrenia or psychosis [7].

The same occurred in the 70's with monoaminooxidase (MAO) pathway or the serotonergic system in the 90's in depression treatment [8], with a relevant role for MAO inhibition with amitriptylin or for selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine, that are both still available today [9].

In other words, in this 21st century, there are several therapeutic options for mental disorders treatment, some of those drugs have 70 years old and others were recently included in the market.

What is relevant is that according to our study, the efficacy in terms of days spent in hospital or number of re-hospitalizations, no improvement have seen over decades, not matter what treatment patient's have recieved.

It is true that the side effects associated with the use of old drugs have been reduced with the new options. If the number of medical records in the study would been greater, probably the difference between old and new therapeutic options could have been statistically significant. However, it is also fair to recognize that the cost of these innovative drugs are extremely high for the benefits associated to their used, aspects that should be take into account specially in low income countries. In this study the cost of the new drugs included during the last two decades, increased 9 times in relation to the old ones, (i.e. typical versus new antipsychotics) without obtaining a significantly impact in terms cost/effectiveness ratio [10-13].

It is clear that the present study has limitations. It is fair to accept that there are many aspects that vary from decade to decade, and that were not considered in the analysis. It is also true that the effectiveness in terms of re-entry to family or return to work activities, is an important data not included because not all medical records had this data. We are also aware of the limitations of side effects analysis, since it was done globally, without discriminating between mild and severe effects, or comparing each therapeutic group with each other.

Our intention was just to put in evidence the poor results that pharmacological therapies have had for the treatment of mental health problems over the years, compared to other diseases like cardiac illness (i.e. mortality before and after bypass or stenting techniques); or infectious disease (mortality when only penicillins and sulfa existed at current deaths). Clearly there are branches of medicine that have advanced more than others, and among the latter examples are pharmacological options for mental disorders.

Conclusion

This case-study shows that even when therapeutical options for mental disorders exponentially increased in the last decades, effectiveness of pharmacological treatments (in terms of length of hospitalization and in the average number of hospital re-admissions per patient) have not changed substantially during the last 70 years, while during that period of time, the costs of these same drugs have increased 9 times.

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