

## Prescribing and Conducting Non-Pharmacological Management of Patients With Decompensated Heart Failure

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This cross-sectional study aimed to describe the prescription of non-pharmacological management of patients with heart failure attending the emergency care of a hospital and the effectiveness of the practice. 256 patients aged 63±13 years, 153 (60%) men, participated in the research. The most commonly prescribed non-pharmacological treatment was sodium restriction, 240 (95%), followed by weight control, 135 (53%). Fluid restriction and fluid balance were the least commonly prescribed treatments, 95 (37%) and 72 (28%), respectively. Only 38 (54%) of balances, 89 (67%) of weight controls and 69 (57%) of diuresis controls were performed. Concerning patients' previous knowledge of the treatments, 229 (90%) were advised to restrict salt intake, and 163 (64%) were advised to restrict fluid intake. Weight control was the least commonly known care, 117 (46%). Except for salt control, the other treatments were prescribed in slightly more than half of the samples, and were ineffective.

Descriptors: Heart Failure; Nursing Care; Cross-Sectional Studies.

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## Prescrição e realização do manejo não farmacológico para pacientes com insuficiência cardíaca descompensada

É estudo transversal com o objetivo de descrever a prescrição de manejo não farmacológico a pacientes com insuficiência cardíaca descompensada, internados em emergência, e a efetividade da realização. Incluíram-se 256 pacientes, idade média  $63\pm 13$  anos, 153 (60%) sujeitos do sexo masculino. O cuidado não farmacológico mais prescrito foi restrição de sódio, 240 (95%), seguido de controle de peso 135 (53%). Restrição hídrica e balanço hídrico foram menos prescritos, 95 (37%) e 72 (28%), respectivamente. Apenas 38 (54%) dos balanços, 89 (67%) dos controles de peso e 69 (57%) dos controles de diurese foram realizados. Quanto ao conhecimento prévio dos pacientes sobre esses cuidados, 229 (90%) receberam orientação para controle de sal e 163 (64%) para controle hídrico. Controle de peso foi o cuidado menos conhecido, com 117 (46%). À exceção do controle de sal, os demais foram prescritos em pouco mais da metade da amostra, além de ser insatisfatória a efetividade da sua realização.

Descritores: Insuficiência Cardíaca; Cuidados de Enfermagem; Estudos Transversais.

## Prescripción y realización del manejo no-farmacológico para pacientes con insuficiencia cardíaca descompensada

Se trata de un estudio transversal con objetivo de describir la prescripción del manejo no-farmacológico de pacientes con insuficiencia cardíaca descompensada, internados en la emergencia y la efectividad de su realización. Se incluyeron 256 pacientes, con edad promedio de  $63\pm 13$  años, siendo 153 (60%) del sexo masculino. El cuidado no-farmacológico más prescrito fue la restricción de sodio, 240 (95%), seguido de control de peso 135 (53%). La restricción hídrica y el equilibrio hídrico fueron menos prescritos, 95 (37%) y 72 (28%), respectivamente. Apenas 38 (54%) de los equilibrios hídricos, 89 (67%) de los controles de peso y 69 (57%) de los controles de diuresis, fueron realizados. En cuanto al conocimiento previo de los pacientes sobre esos cuidados, 229 (90%) recibieron orientación para control de la sal y 163 (64%) para el control hídrico. El control de peso fue el cuidado menos conocido, con 117 (46%). Excepto el control de sal, los demás fueron prescritos para un poco más de la mitad de la muestra, además de ser insatisfactoria la efectividad de su realización.

Descriptorios: Insuficiencia Cardíaca; Atención de Enfermería; Estudios Transversales.

## Introduction

Heart failure (HF) is a chronic and progressive syndrome, manifested by a set of signs and symptoms of pulmonary and systemic congestion, characterized as the final stage of all cardiovascular diseases<sup>(1)</sup>. This syndrome affects between 1.5% and 2% of the world population. Incidence rates have increased in the last three decades, especially in the group over 65 years of age<sup>(2)</sup>. Despite the benefits achieved as a result of HF treatment evolution, this syndrome is still responsible for high mortality rates and patients' decreased functional capacity<sup>(3)</sup>.

As one of the main public health problems, HF entails high costs for the health system, significantly contributing to the rise in rehospitalization rates. These are quite high after the first hospitalization due to decompensated HF, mainly between 30 and 90 days after discharge<sup>(4)</sup>. A prospective observational study that compared hospitalizations due to HF between a Brazilian and a North-American university hospital showed that rehospitalization rates in this same period amounted to 36% and 51%, respectively<sup>(5)</sup>.

HF treatment goals include maintaining patients clinically stable, bringing down morbidity and mortality and stimulating adherence to the prescribed treatment, achieved through a treatment that is considered quite complex<sup>(1)</sup>. Besides improvements in pharmacological treatment, the current HF approach shows that non-pharmacological treatment is a component and essential part to treat this syndrome<sup>(1)</sup>. Recent meta-analyses that assessed patient follow-up by multidisciplinary teams, including the use of non-pharmacological measures in their treatment, indicated positive effects on the reduction of morbidity-mortality, rehospitalization rates, shorter hospitalization periods, enhanced functional patterns and, mainly, a better quality of life<sup>(6-7)</sup>.

Thus, non-pharmacological management is an essential tool in cases of HF. Nurses' important role in this approach includes orientations regarding weight control, sodium and fluid restriction, regular physical exercise and regular medication intake monitoring, besides the early recognition of signs and symptoms of decompensated HF<sup>(8)</sup>.

Literature evidence underlines that these measures are fundamental for treatment and clinical follow-up, offering benefits for this group<sup>(9)</sup>. Our research group developed a study that indicated that non-pharmacological management has not been fully incorporated in clinical practice. In that study, 283 hospitalizations of 239 patients were assessed, between August 2000 and June 2003, to describe non-pharmacological management of HF patients hospitalized at clinical units. Sodium restriction was present in 97% of the prescriptions, diuresis control in 85%, fluid balance in 75%, weight control in 61% and fluid restriction in only 25% of hospitalizations. Although present in the prescriptions, some of this care was not performed as continuously as prescribed. Only 18% of fluid balance, 25% of fluid restriction, 35% of weight control and 27% of diuresis control prescriptions were actually performed by the nursing team ( $P < 0.01$  for all comparisons). Hence, that study indicated that this management, even at a university hospital, had not been fully incorporated into clinical practice and that, even when non-pharmacological measures were prescribed, their accomplishment by the nursing team was deficient<sup>(10)</sup>.

This study was designed because many patients admitted with decompensated HF stay at the emergency due to lack of beds at hospitalization units and are often discharged directly from this unit.

## Objective

To assess the prescription and effective practice of non-pharmacological management for HF patients

admitted at the emergency care of a public teaching hospital.

## Methods

This contemporary cross-sectional study looked at the prescription profile of non-pharmacological management for patients hospitalized with decompensated HF at an emergency care. The sample comprised hospitalized patients diagnosed with heart failure classified as functional class III and IV according to the New York Heart Association (NYHA); of any cause; with left ventricular ejection fraction  $\leq 45\%$ ; age  $\geq 18$  years; male and female; who agreed to participate in the study. Patients with HF after acute myocardial infarction occurred in the previous three months were excluded, as well as patients with HF after sepsis; patients submitted to coronary artery bypass graft in the previous 30 days; patients with neurological sequelae; patients who did not agree to participate in the study.

For data collection, an instrument was used with information regarding sodium restriction, diuresis control, fluid balance, weight control, fluid restriction prescriptions and the respective variables for the effective practice of this care. Data on the number of hospitalizations, signs and symptoms of decompensated HF and previous knowledge on non-pharmacological measures were also included. Our group had previously used this instrument in other studies<sup>(11)</sup>. Information related to demographic and clinical sample characteristics was also collected. Approval for this study was obtained from the institutional review board, registered under number 08-353. All patients read and signed the Informed Consent Term.

With prevalence of prescribed weight control set at 61%<sup>(10)</sup>, an error margin of six percentage points and 95% confidence level, the estimated study sample contained 256 patients.

## Data analysis

Statistical Package for Social Sciences 14.0 software was used for analyses. Continuous variables were expressed as mean  $\pm$  standard deviation for variables with normal distribution and median and interquartile interval (25 and 75 percentiles) for non-parametric data. Categorical variables were expressed as percentages. For comparisons between non-parametric data, Spearman's correlation coefficient was used and, for parametric data, Pearson's coefficient. Two-tailed  $P < 0.05$  was considered statistically significant.

## Results

In this study, 256 patients diagnosed with decompensated HF were analyzed. The patients' mean age was  $63 \pm 13$  years; most were men, 153 (60%); and mainly white, 196 (77%). Median education was 5 years (2-8), and median family income 2 (1-3) minimum wages. The mean left ventricular ejection fraction was  $29 \pm 9$  % and the most frequent cause ischemic, with 85 (34%) cases. According to NYHA criteria, 168 (66%) patients were classified in functional class III. These and other data are shown in Table 1.

Table 1 – Demographic and clinical characteristics of decompensated HF patients hospitalized at an emergency unit. Porto Alegre, 2008

| Patients                               | n = 256     |
|--|-------------|
| Age, years*                            | $63 \pm 13$ |
| Gender, male†                          | 153 (60)    |
| Skin color, white†                     | 196 (77)    |
| Education, years‡                      | 5 (2-8)     |
| Family income, years‡                  | 2 (1-3)     |
| Left Ventricular Ejection Fraction, %* | $29 \pm 9$  |
| Functional class III (NYHA)†           | 168 (66)    |
| Etiology†                              |             |
| Ischemic                               | 85 (34)     |
| Hypertensive                           | 80 (32)     |
| Idiopathic                             | 43 (17)     |
| Alcoholic                              | 27 (11)     |
| Others                                 | 31 (12)     |

Obs.: NYHA: New York Heart Association. \* Variable shown with mean  $\pm$  standard deviation. †Categorical data displayed with n (%); ‡Variable shown with median and 25-75 percentiles.

The frequency of prescribed non-pharmacological management is described in Table 2. Among the care this management comprises, sodium restriction was the most frequently prescribed, totaling 240 (95%), followed by weight control, with 135 (53%). Fluid balance and fluid restriction were the least present in the prescription.

Table 2 – Non-pharmacological care prescribed to decompensated HF patients hospitalized at an emergency unit. Porto Alegre, 2008

| Non-pharmacological care | n = 256  |
|--------------------------|----------|
| Sodium restriction       | 240 (95) |
| Fluid restriction        | 95 (37)  |
| Diuresis control         | 124 (48) |
| Weight control           | 135 (53) |
| Fluid balance            | 72 (28)  |

Obs.: Categorical data displayed with n (%).

Although the prescriptions covered non-pharmacological care, as shown in the above table, care practice was not as frequent as the prescriptions. Only 38 (54%) cases of fluid balance, 89 (67%) of weight control and 69 (57%) of diuresis control were actually performed by the nursing team ( $P < 0.001$  for all comparisons). Figure 1 represents the percentage of prescribed non-pharmacological care, followed by percentages of care put in practice.

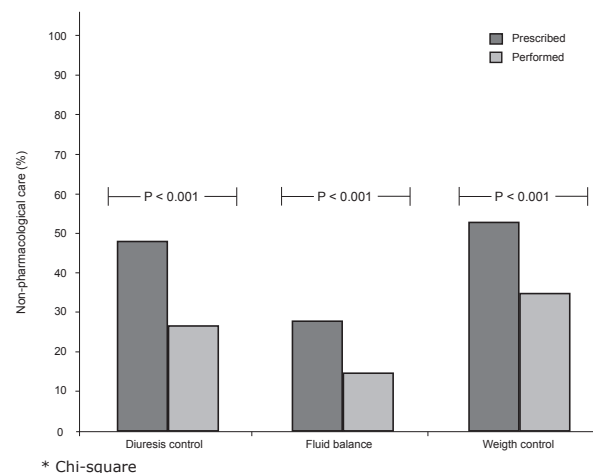


Figure 1 – Prescribed and performed non-pharmacological care. Source: Direct research by the authors. Porto Alegre (RS), 2008

Congestion signs and symptoms in decompensated HF patients upon arrival at the emergency care included dyspnea, with 233 (91%); paroxysmal nocturnal dyspnea, with 223 (87%); fatigue, 173 (68%); and edema, 164 (64%). Although a large number of patients presented signs and symptoms of congestion upon arrival at the emergency, the prescription of non-pharmacological measures, which direct HF management treatment, was considered unsatisfactory, as shown in Figure 1.

The relation between the number of previous hospitalizations and patients' knowledge of non-pharmacological measures was analyzed. Regarding the number of hospitalizations, 80 (31%) patients had never been hospitalized due to decompensated HF in the previous 12 months, while 58 (23%) had been hospitalized at least once and 117 (46%) at least twice in the same period.

A weak correlation was identified between knowledge on non-pharmacological measures (sodium restriction, fluid restriction, diuresis control, fluid balance and weight control) and number of previous

hospitalizations due to decompensated HF, with  $r_s = 0.3$  ( $P < 0.001$ ).

An analysis of previous orientations on non-pharmacological measures patients received from any health professional showed that almost all patients received recommendations to control sodium intake, 229 (90%). Regarding knowledge on other non-pharmacological measures, 181 (71%) received orientations for regular physical exercise, 163 (64%) for fluid intake control, while 117 (46%) had received orientations on the importance of daily weight control.

The analysis of previous knowledge on the combination of three non-pharmacological measures (sodium restriction, fluid restriction and weight control) in comparison with the number of hospitalizations due to HF in the previous year, however, revealed limited knowledge on these measures among patients who had never been hospitalized due to decompensated HF. On the other hand, patients with five or more hospitalizations in the same period fully knew about the combination of these care measures. In the group of 256 patients, 80 (31%) had never been hospitalized due to decompensated HF. Sixty-four (80%) did not know about the combination of non-pharmacological measures. Among the 35 (14%) patients hospitalized five times or more, 21 (60%) knew the three measures. All comparisons were statistically significant ( $P < 0.001$ ). Data are shown in Table 3.

Table 3 – Number of hospitalizations due to decompensated HF and previous knowledge on the combination of three non-pharmacological measures (sodium restriction, fluid restriction and weight control). Porto Alegre, 2008

| No hospitalizations  | Total patients | Knowledge | No knowledge |
|----------------------|----------------|-----------|--------------|
| No hospitalization   | 80             | 16 (32)   | 64 (65.3)    |
| 2 hospitalizations   | 33             | 13 (26)   | 20 (20.4)    |
| ≥ 5 hospitalizations | 35             | 21 (42)   | 14 (14.3)    |

Obs.: Categorical data displayed with n (%). \* Chi-Square Test.  $P < 0.001$ .

## Discussion

In this study, we assessed the prescription profile and actual accomplishment of non-pharmacological measures for patients hospitalized with decompensated HF at an emergency care. Although sodium restriction was the most prescribed measure, the presence of fluid balance, fluid restriction and diuresis control was limited in the prescriptions. Regarding the nursing team's performance of non-pharmacological care, frequency

levels remained below prescription levels.

Sodium restriction was prescribed to almost all patients. This result shows agreement in clinical practice on the possible benefits of sodium restriction for HF patients. Excess salt consumption entails multiple effects for the human organism, including increased activity of the renin-angiotensin system<sup>(11)</sup>. Excessive activation of this system due to high sodium intake results in water retention and has been associated with cardiac hypertrophy and congestive HF<sup>(12)</sup>. In line with these findings, a low-sodium diet is recommended for HF patients as a preventive measure to decrease fluid retention and, consequently, decompensated HF. The extent of the restriction depends on how severe the heart failure is. Patients with severe HF should be oriented to consume 2g/day of sodium. This restriction level is achieved by excluding sodium-rich foods and avoiding added salt to prepared meals<sup>(3)</sup>.

As for fluid restriction, prescription included this care for less than 50% of patients. Although a recent study has indicated that fluid restriction is not an effective strategy in HF treatment<sup>(13)</sup>, in clinical practice, moderate to severe HF patients are recommended to limit fluid intake to 1.5 liters/day. New Brazilian guidelines for the treatment of this syndrome recommend restrictions between 1.0 and 1.5 liters/day for symptomatic patients at risk of hypervolemia<sup>(1)</sup>.

According to HF diagnostic criteria<sup>(14)</sup>, paroxysmal nocturnal dyspnea is considered an important sign to diagnose decompensated HF. In this study, 87% of patients presented this symptom at the moment of hospitalization, which could justify fluid restriction indications. Nevertheless, this care was prescribed to only 37% of patients.

Sudden weight gain is frequently associated with fluid retention and, consequently, with the worsening of HF. Among the study patients, prescriptions included weight control for 53%. This measure should be monitored daily during hospitalization, as a parameter of patients' clinical evolution and as a reference to adjust diuretic therapy. In the hospitalization context, daily weight monitoring also plays the important role of stimulating patients to incorporate periodical weight control in their daily practice<sup>(10)</sup>.

A randomized study to assess the effect of nursing orientations and care on HF patients' adherence to non-pharmacological measures showed that patients from the intervention group, who received orientations more intensively, were able to identify and seek care in case of sudden weight gain (86%), against 69% in the group

that only received orientations during the cardiology consultation, with  $P < 0.01$ <sup>(15)</sup>.

An analysis of non-pharmacological care practice showed that these measures were not performed as frequently as they were prescribed. On the average, the care team actually performed little less than half of the prescribed care. A study published in 2006, which assessed the actual accomplishment of this care at hospitalization units showed similar percentages for the practice of these measures<sup>(10)</sup>. These data may suggest lack of knowledge on the relevance and benefits of putting in practice these measures to support medication treatment.

In the context of IC, clinical examination is a useful tool for diagnostic purposes, to assess the severity of the disease and make decisions on the best therapeutic conduct to be adopted. The presence of specific signs and symptoms can be useful to classify patients according to severity level, mortality risk and need for hospitalization<sup>(16)</sup>. In this perspective, clinical examination of patients admitted with decompensated HF becomes extremely important to guide the choice of the most adequate interventions<sup>(17)</sup>.

In our study, 91% of patients mentioned dyspnea upon arrival at the emergency care. Another study, which assessed the clinical profile of HF patients, identified similar percentages for the presence of this symptom in 85.2% of cases<sup>(18)</sup>. Like dyspnea, edema is a common finding in decompensated patients<sup>(19)</sup>. Peripheral edema and hepatojugular reflux are useful signs for prognosis stratification purposes in systolic HF patients. These signs can define the different levels of heart disease and disease severity<sup>(16,20)</sup>.

Non-pharmacological care is acknowledged as an essential tool in decompensated HF patient treatment. Although most patients manifest some sign of congestion upon arrival at the emergency care, care to avoid congestion and guide diuretic treatment received little attention in the prescriptions. One of the main reasons for decompensated HF is lack of adherence to pharmacological and non-pharmacological treatment, often due to lack of knowledge on these aspects<sup>(1)</sup>. A great gap is perceived between what patients are taught and what they absorb. A study involving 113 outpatients identified incoherence between what they were taught and what they actually applied in practice<sup>(21)</sup>. Assessing these findings and relating them with our study results regarding previous knowledge on non-pharmacological

measures and number of hospitalizations showed that, even if patients have good knowledge on these measures, this does not decrease hospitalization rates. The patients with the largest number of hospitalizations also revealed the highest previous knowledge levels. Our group also carried out a previous study with similar results among hospitalized patients at the same institution. In that previous study, we demonstrated that patients with more previous hospitalizations seem to have quite high knowledge levels on aspects involving HF physiopathology and management. Besides, these patients are in more severe conditions and have been symptomatic longer<sup>(10)</sup>. We attributed these findings to the fact that patients with more hospitalizations have more contact with on non-pharmacological management orientations. These data indicate that knowing the disease and care practice aspects does not necessarily avoid repeated hospitalizations.

## Conclusion

Based on the results of this observational study, it can be demonstrated that, even at a teaching hospital, prescriptions of non-pharmacological measures were limited for patients admitted at an emergency care, except for sodium control.

Regarding the accomplishment of non-pharmacological care, we identified a gap between prescriptions and practice. It was demonstrated that this care was not fully accomplished by the nursing team.

Although patients presented signs and symptoms of pulmonary/systemic congestion upon admission, this exerted little effect on the prescription of non-pharmacological measures to guide treatment and support the clinical monitoring of congestive conditions.

Likewise, based on these study findings, it can be concluded that patients with higher hospitalization rates seem to have better knowledge on the disease and self-care, although this knowledge does not imply greater adherence to the orientations and decreased rehospitalization rates.

These data indicate that care teams need to create strategies to enhance adherence to the prescription of non-pharmacological measures. Furthermore, investments are needed in qualification programs for professionals active in care delivery to these patients, so as to instruct them on the relevance and importance of putting in practice non-pharmacological measures for decompensated patient management.

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