



## DELIRIUM IN THE HOSPITALIZED ELDERLY: EVALUATION OF PRECIPITATING FACTOR

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### ABSTRACT

**Objective:** To evaluate the association of precipitating factors with the occurrence of *delirium* in hospitalized elderly. **Method:** Quantitative, longitudinal, exploratory study conducted in a public hospital in northern Paraná in patients aged 60 years or older. The sample collected was 315 elderly, of which 67 had *delirium* during the study. Patients with a minimum hospitalization of 48 hours were included, and the data collected with the elderly, companion, health professional or in the medical record, daily, during the first week of hospitalization or until hospital discharge, transfer, death or diagnosis of *delirium*. **Results:** In the logistic regression analysis, there was an association of *delirium* with the precipitating factors: longer hospital stay in the emergency room, physical restraint, presence of a companion, disease severity, changes in urea, creatinine and C-reactive protein, presence of infection; deprivation of natural light, use of oxygen therapy and urinary catheterization. There were 26 significant correlations between the precipitating factors associated with *delirium* triggering. There was an association of *delirium* with worsening prognosis, longer hospital stay and death. **Conclusion:** Multiprofessional interventions controlling the occurrence of precipitating factors may contribute to the reduction of *delirium* cases, impacting the length of hospitalization, morbidity and mortality of the hospitalized elderly.

**Keywords:** Neurocognitive Disorders. *Delirium*. Aged. Risk Factors. Nurse.

### INTRODUCTION

The growth of the elderly population is a global reality, and the projection for Brazil is that life expectancy will jump from 62.6 years in 1980 to 81.29 years in 2050<sup>(1)</sup>. The elderly represent a considerable portion of hospital admissions, *delirium* being a common and worrying problem in the hospitalization of the elderly. Characterized by an acute confusional state based on an organic change, it has an incidence of up to 42% in hospitalized patients and up to 92% in critical patient units<sup>(2)</sup>. Even with high incidence, underdiagnosis and consequent subtraction are frequent<sup>(3,4)</sup>. The elderly with *delirium* are exposed to a higher risk of mortality, increased length of hospitalization, increased risk of readmission, and worsening prognosis after hospital discharge<sup>(3-7)</sup>.

*Delirium* can be understood as a neurocognitive disorder characterized by

disturbance in attention accompanied by reduced awareness of the environment<sup>(8)</sup>. It develops through neurological inflammatory processes, dysfunction and altered brain metabolism, imbalance of neurotransmitters and neuronal connectivity. It results from a complex interaction between the basal vulnerability of the patient and the harmful insults that occur during hospitalization. If the vulnerability is high, a minor harmful attack is sufficient to trigger *delirium* and vice versa<sup>(9,10)</sup>. It can be classified according to its duration (acute or persistent), psychomotor activity (hyperactive, hypoactive or mixed), or period of development (prevalent, incident and occurring)<sup>(8,10)</sup>. The prevalent *delirium* is described as that confusional picture already installed in the elderly at the time of hospitalization; *delirium* is incident when triggered during hospitalization, and occurs when detected during hospitalization, regardless of whether started during hospitalization or not<sup>(10,11)</sup>.

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The most promising evidence related to *delirium* reduction stands out through multiprofessional activities of identification, prevention, treatment and management of the factors associated with the development of *delirium*, added to the early diagnosis, resulting in a reduction of up to 40% in-hospital *delirium* incidence, with consequent reduction of sequelae and dementia after discharge<sup>(10,12-14)</sup>. Given the relevance of this theme, one has as a research question: What are the intrahospital precipitating factors associated with the development of *delirium* in hospitalized elderly? To answer it, this study aimed to evaluate the association of precipitating factors with the occurrence of *delirium* in hospitalized elderly. It is expected, as justification of this study, that its results provide subsidies for the identification of factors associated with *delirium* in which may contribute to the identification of elderly at risk and implementation of measures to prevent and control these factors, with a perspective of reducing morbidity and mortality.

## METHOD

This is a quantitative, longitudinal, exploratory study conducted in a public hospital of medium complexity in southern Brazil. The population was composed of elderly patients (60 years or older) hospitalized. The sample calculation resulted in a total of 306 elderly, based on the incidence of 38% of *delirium* in Ahmed's systematic review and meta-analysis<sup>(11)</sup>. The sample was collected from 315 elderly, from May to September 2017.

The elderly with a minimum hospitalization time of 48 hours were included. The exclusion criteria were: the elderly with *delirium* during the initial evaluation (prevalent *delirium*), who underwent elective surgery, not evaluated within 48 hours of hospitalization and those who participated in the pilot test.

To adjust the method and the collection instruments, two pilot tests were performed. Data were collected from medical records, with health professionals, the elderly or qualified companion. The collection was divided into two stages: the first for the identification of prevalent *delirium* (excluded cases) and risk factors between the initial 48 hours of hospitalization.

The second step was through daily evaluations with the application of the diagnostic screening scale (for identification of incident *delirium*, cases included) and identification of new precipitating factors during the seven days after hospitalization and after initial evaluation. Therefore, the elderly were followed for seven days or until hospital discharge, transfer, death or development of *delirium*.

The dependent variable was the development of *delirium* in the first seven days of hospitalization, assessed by the Confusion Assessment Method (CAM) scale. This evaluation method obtained sensitivity of 94.1% and specificity of 96.4% in the validation for Portuguese<sup>(15)</sup>. It consists of four criteria: A) acute onset and floating course; B) lack of attention; C) disorganized thinking; D) alteration of the level of consciousness. For the diagnosis of *delirium*, criteria A and B must be present plus the presence of criterion C and/or D.

The following precipitating risk factors were considered independent variables: 1) restraint in bed; 2) severity of physical disease, assessed daily by the Therapeutic Intervention Scoring System-28 (TISS-28)<sup>(16)</sup>; 3) metabolic disorders (urea, creatinine, sodium, potassium, metabolic acidosis, C-reactive protein (CRP) and serum albumin); 4) presence of infection; 5) use of opioid; 6) environmental factors: a) presence of companion, b) absence of natural light, c) bed transfer (remain or be transferred from the emergency room (PS)); 7) procedures: a) oxygen therapy, b) urinary catheterization, c) invasive medical procedure. The significant variables related to *delirium* were then grouped into the acute pathological domains and environmental factors during correlations<sup>(17)</sup>.

Data were organized in spreadsheets and analyzed in the Statistical Package for Social Science (SPSS) program. Descriptive analyses, association tests (chi-square) between the precipitating factors and the occurrence of *delirium* were performed. For some factors, logistic binary regression was performed to obtain the odds ratio (odds ratio – OR).

The study was approved by the Research Ethics Committee of the State University of Londrina on 12/16/2014, CAAE 39401314.4.0000.5231. The researcher evaluated the patients, who were included in the

research after their authorization or their legal guardian over 18 years, with signature of the Informed Consent Term. There were no occurrences involving only minors as sole responsible. The *delirium* cases identified in the study and that were not described in the medical record were reported to the nurse of the hospitalization unit for the proper records and interventions.

## RESULTS

The continuous variables presented  $p < 0.001$  in the Shapiro-Wilk test, which indicates non-normal distribution, and the median as a measure of central tendency. 449 elderly people were evaluated, of which 134 (29.9%) already had

*delirium* on admission (prevalent *delirium*), and were excluded from the study. The sample was then analyzed by 315 hospitalized elderly, of which 67 (14.9%) developed *delirium* during hospitalization (incident *delirium*; exposed cases), and 248 (79%) did not develop *delirium* during hospitalization (unexposed cases). More than half of the cases of incident *delirium* (39 – 57.4%) developed until the second day of hospitalization, mostly of hypoactive character (38 – 56.7%. To highlight the severity of this syndrome, 201 (44.8%) cases (*delirium* occurring) were diagnosed among included and excluded patients.

The participants were similar regarding losses, except for the variables transfer and death (Table 1).

**Table 1.** Distribution of characteristics of the surveyed population and losses. Londrina, Paraná, Brazil 2017

|                     | Surveyed population (n:315) |       | Losses (n:71) |      |
|---------------------|-----------------------------|-------|---------------|------|
|                     | N                           | %     | N             | %    |
| <b>Sex:</b>         |                             |       |               |      |
| Feminine            | 168                         | 82.8  | 35            | 17.2 |
| Masculine           | 147                         | 80.3  | 36            | 19.7 |
| <b>Outcome:</b>     |                             |       |               |      |
| Discharge           | 268                         | 83.2  | 54            | 16.8 |
| Transfer            | 27                          | 65.9  | 14            | 34.1 |
| Death               | 12                          | 85.7  | 2             | 14.3 |
| Got away            | 3                           | 100.0 | 0             | -    |
| Requested discharge | 5                           | 83.3  | 1             | 16.7 |

The Mann-Whitney test ( $p=0.005$ ) showed a difference in hospitalization time, where those who presented *delirium* had a longer hospitalization period (mean 9.3, median 8, SD 7.4), on average two days more than those without *delirium* (mean 7.4, median 6, SD 4.2).

Regarding precipitating factors, *delirium* was associated with the presence of infection, patient severity, physical restraint, bladder catheterization, oxygen therapy and deprivation of natural light through a wide window. Longer length of stay in the ER (no change of bed) and

presence of companion during hospitalization were also associated. Most patients in the *delirium* group underwent some type of procedure during the first week of hospitalization before developing *delirium* (Table 2). The evolution of the TISS-28 from the day of hospitalization to the day of development of *delirium* was also significant ( $p < 0.001$ ), but discrete, with Rô de Spearman of 0.294. The use of morphine was not associated with *delirium*, due to the low number of elderly using opioids.

**Table 2.** Distribution of precipitating risk factors for delirium with categorical variables identified in the hospitalization of elderly people. Londrina, Paraná, Brazil, 2017

|                                   | With <i>delirium</i> |      | Without <i>delirium</i> |      | Chi-quadrado (p-value)) | OR Adjusted by age (95%CI; p-value) |
|-----------------------------------|----------------------|------|-------------------------|------|-------------------------|-------------------------------------|
|                                   | N                    | %    | N                       | %    |                         |                                     |
| <b>Precipitating risk factors</b> |                      |      |                         |      |                         |                                     |
| <b>Use of morphine</b>            |                      |      |                         |      |                         |                                     |
| Yes                               | 4                    | 44,4 | 5                       | 55,6 | 0,085                   | 3,19 (0,81-12,68; 0,099)            |
| No                                | 63                   | 20,6 | 243                     | 79,4 |                         |                                     |

|                               |    |      |     |      |                  |                                       |
|-------------------------------|----|------|-----|------|------------------|---------------------------------------|
| <b>Infection</b>              |    |      |     |      | <b>0,005</b>     |                                       |
| Yes                           | 51 | 26,4 | 142 | 73,6 |                  | <b>2,20 (1,17- 4,14; 0,014)</b>       |
| No                            | 16 | 13,1 | 106 | 86,9 |                  | <b>1,00</b>                           |
| <b>TISS-28</b>                |    |      |     |      |                  |                                       |
| Class I                       | 57 | 19,3 | 239 | 80,7 | <b>&lt;0,001</b> | -                                     |
| Class II                      | 9  | 50,0 | 9   | 50,0 | <b>&lt;0,001</b> |                                       |
| Class III                     | 1  | 100  | 0   | 0,0  |                  |                                       |
| Class IV                      | 0  | 0,0  | 0   | 0,0  |                  |                                       |
| ≤11 points                    | 24 | 16,2 | 124 | 83,8 |                  | 1,00                                  |
| ≥12 points                    | 43 | 25,7 | 124 | 74,3 | <b>&lt;0,001</b> | 1,72 (0,97-3,07; 0,064)               |
| <b>Physical restraint</b>     |    |      |     |      | <b>&lt;0,001</b> |                                       |
| Yes                           | 10 | 76,9 | 3   | 23,1 |                  | <b>25,53 (6,17-105,65; &lt;0,001)</b> |
| No                            | 57 | 18,9 | 245 | 81,1 |                  | <b>1,00</b>                           |
| <b>Procedures</b>             |    |      |     |      |                  |                                       |
| a) Oxygen therapy             |    |      |     |      |                  |                                       |
| Yes                           | 36 | 29,5 | 86  | 70,5 | <b>0,004</b>     | <b>2,03 (1,15-3,58; 0,015)</b>        |
| No                            | 30 | 15,8 | 160 | 84,2 |                  | 1,00                                  |
| b) Bladder catheterization    |    |      |     |      |                  |                                       |
| Yes                           | 16 | 39,0 | 25  | 61,0 | <b>0,003</b>     | <b>2,53 (1,23-5,21; 0,012)</b>        |
| No                            | 51 | 18,6 | 223 | 81,4 |                  | 1,00                                  |
| c) Invasive medical procedure |    |      |     |      |                  |                                       |
| Yes                           | 1  | 6,2  | 15  | 93,8 |                  | NA*                                   |
| No                            | 65 | 22,1 | 229 | 77,9 | 0,131            |                                       |
| <b>Environment</b>            |    |      |     |      |                  |                                       |
| a) Companion                  |    |      |     |      |                  |                                       |
| Yes                           | 56 | 24,2 | 175 | 75,8 | <b>0,044</b>     | 1,33 (0,63-2,82; 0,450)               |
| No                            | 11 | 13,6 | 70  | 86,4 |                  | 1,00                                  |
| b) Access to natural light    |    |      |     |      |                  |                                       |
| Yes                           | 24 | 11,9 | 178 | 88,1 |                  | 1,00                                  |
| No                            | 43 | 38,0 | 70  | 62,0 | <b>&lt;0,001</b> | <b>4,74 (2,62-8,63; &lt;0,001)</b>    |
| c) Change of bed (PS)         |    |      |     |      |                  |                                       |
| Yes                           |    |      |     |      |                  |                                       |
| No                            | 41 | 16,2 | 212 | 83,8 |                  | 1,00                                  |
|                               | 26 | 58,0 | 36  | 42,0 | <b>&lt;0,001</b> | <b>3,89 (2,06-7,33; &lt;0,001)</b>    |

\*NA= Not assessed due to p-value  $\geq 0.200$  in the chi-square test.

Table 3 presents the analyses with the laboratory tests that were recorded of the elderly, whose results were available within 72 hours of hospitalization.

The results of serum albumin, sodium, potassium and occurrence of metabolic acidosis

were not significant in the association tests with *delirium*.

Regarding death, the *delirium* group had 14.9% of deaths, and the no *delirium* group 0.8%, with OR 21.58 (95%CI: 4.60-101.19;  $p < 0.001$ ) in binary logistic regression.

**Table 3.** Precipitating risk factors related to laboratory tests. Londrina, Paraná, Brazil, 2018

| Precipitating risk factors              | With <i>delirium</i> |      | Without <i>delirium</i> |      | OR (95%CI; p-value)     | OR Adjusted by age (95%CI; p-value) |
|---|----------------------|------|-------------------------|------|-------------------------|-------------------------------------|
|   | N                    | %    | N                       | %    |                         |                                     |
| <b>Urea</b><br>(17 - 43mg/dL)           |                      |      |                         |      |                         |                                     |
| Normal                                  |                      |      |                         |      |                         | <b>1.00</b>                         |
| High                                    | 16                   | 13.8 | 100                     | 86.2 | 1.00                    | <b>1.99 (1.04-3.80; 0.037)</b>      |
|   | 46                   | 27.9 | 119                     | 72.1 | 2.42 (1.29-4.53; 0.006) |                                     |
| <b>Creatinine</b><br>(0.81 - 1.44mg/dL) |                      |      |                         |      |                         |                                     |

|                 |    |      |     |      |                          |                          |
|-----------------|----|------|-----|------|--------------------------|--------------------------|
| Normal          | 40 | 18.7 | 174 | 81.3 | 1.00                     | 1.00                     |
| Low             | 0  | 0    | 6   | 100  | -                        | -                        |
| High            | 22 | 30.1 | 51  | 69.9 | 1.88 (1.02-3.44; 0.042)  | 1.08 (1.04-1.12; <0.001) |
| <b>CRP</b>      |    |      |     |      |                          |                          |
| (below 8.0mg/L) |    |      |     |      |                          |                          |
| Normal          | 3  | 6.0  | 47  | 94.0 | 1.00                     | 1.00                     |
| High            | 59 | 27.2 | 158 | 72.8 | 5.85 (1.75-19.52; 0.004) | 5.29 (1.57-17.83; 0.007) |

\*NA= Not assessed due to p-value  $\geq 0.200$  in the chi-square test.

The total number of significant variables related to *delirium* was 12; these correlated variables totaled 66 correlations, of which 26 obtained statistical significance (Table 4).

Within the domain of acute pathology, in order of decreasing correlational force it was obtained: the disease severity variable with 8 significant correlations (CS); high urea: 7 CS; high creatinine: 5 CS; high C-reactive protein: 5

CS; urinary catheterization: 5 CS; oxygen therapy: 4 CS; presence of infection: 3 CS; use of psychoactive agents: 2 CS. Composing the ambient domain, it was obtained: absence of natural light: 7 CS; presence of the companion: 2 CS; change of bed (referring to the permanence or not in the PS): 2 CS; physical containment: 2 CS.

**Tabela 4.** Correlation matrix of precipitating factors of delirium in the hospitalized elderly. Londrina, Paraná, Brazil, 2019

|                                      | Presence of infection | Presence of companion | Change of bed (permanence in the PS) | Physical restraint | Use of Psychoactive | Disease severity (TISS-28). | High creatinine | High urea | High CRP | Absence of light | Oxygen therapy | Urinary catheterization |
|--------------------------------------|-----------------------|-----------------------|--------------------------------------|--------------------|---------------------|-----------------------------|-----------------|-----------|----------|------------------|----------------|-------------------------|
| Presence of infection                | 1                     |                       |                                      |                    |                     |                             |                 |           |          |                  |                |                         |
| Presence of companion                | 0,925                 | 1                     |                                      |                    |                     |                             |                 |           |          |                  |                |                         |
| Change of bed (permanence in the PS) | 0,470                 | 0,274                 | 1                                    |                    |                     |                             |                 |           |          |                  |                |                         |
| Physical restraint                   | 0,001                 | 0,084                 | 0,293                                | 1                  |                     |                             |                 |           |          |                  |                |                         |
| Use of psychoactive                  | <0,001                | 0,656                 | 0,317                                | 0,219              | 1                   |                             |                 |           |          |                  |                |                         |
| Disease severity (TISS-28).          | 0,394                 | 0,361                 | 0,009                                | 0,224              | 0,033               | 1                           |                 |           |          |                  |                |                         |
| High creatinine                      | 0,742                 | 0,117                 | 0,704                                | 0,137              | 0,166               | <0,001                      | 1               |           |          |                  |                |                         |
| High urea                            | 0,505                 | <0,001                | 0,293                                | 0,557              | 0,093               | 0,004                       | <0,001          | 1         |          |                  |                |                         |
| High C-reactive protein              | 0,348                 | 0,016                 | 0,640                                | 0,243              | 0,703               | 0,040                       | 0,042           | 0,001     | 1        |                  |                |                         |
| Absence of natural light             | 0,042                 | 0,177                 | <0,001                               | 0,045              | 0,310               | 0,001                       | 0,024           | 0,018     | 0,270    | 1                |                |                         |
| Oxygen therapy                       | 0,332                 | 0,806                 | 0,673                                | 0,250              | 0,157               | <0,001                      | 0,955           | 0,010     | 0,021    | 0,138            | 1              |                         |
| Urinary catheterization              | 0,465                 | 0,341                 | 0,201                                | 0,262              | 0,968               | <0,001                      | <0,001          | 0,012     | 0,362    | 0,001            | <0,001         | 1                       |

The variable change in the waking sleep cycle and dehydration were not evaluated due to collection limitations.

## DISCUSSION

It was observed in this study that the incidence of *delirium* in the elderly was similar to high complexity services, even though they were hospitalized in a medium complexity hospital<sup>(18,19)</sup>. The population studied showed different behavior regarding the variable transfer

and death compared to the group of losses. The hypothesis is that the elderly with prevalent *delirium* presented more severe conditions, which justifies a greater number of transfers to more complex services. In this context, there was a higher percentage of deaths in the studied group associated with incident *delirium*. Thus, the high number of prevalent *delirium* shows late hospitalization of the elderly, in more severe clinical conditions and consequent worsening prognosis, which may reflect the difficulty of access to health services or the late identification of the aggravation of the elderly by the caregivers. Early diagnosis and treatment of the underlying disease would probably lead to a reduction in *delirium* and its deleterious clinical repercussion.

The severity of the disease during hospitalization is clearly associated with *delirium*<sup>(7,20,21)</sup>. The evaluation by the TISS-28 model provided the stratification of severity in an accessible way even in an environment outside intensive care, due to the ease of its application compared to other scales that require greater structure and laboratory monitoring. The significant relationship of severity ( $p < 0.001$ ) between the groups suggests that clinically more severe elderly are more vulnerable, so that each additional point of the TISS-28 scale increases the chances of incident *delirium* by 15.6%. The evolution of TISS-28 to *delirium* allows to affirm that not only the initial severity of the patient but also its evolutionary worsening during hospitalization are risk factors.

Another important factor related to *delirium* is the increase in the length of hospitalization of the elderly in two days compared to the group without *delirium*, with OR 1.95 (CI=1.13-3.37;  $p=0.016$ ), an association already described in other studies<sup>(7,21)</sup>. This difference results in increased hospital costs and exposure time to hospitalization risks.

The presence of infection ( $p=0.005$ ) as a precipitating factor during hospitalization is consistent with other studies, in which special attention should be given to respiratory and urinary tract infections, common among hospitalized elderly<sup>(19,22)</sup>. Linked to this variable, the C-reactive protein, in laboratory examination, was significantly identified in cases that evolved with *delirium* ( $p=0.004$ , OR=5.85).

This finding allows us to infer that the presence of infection, or inflammatory process, was significant in cases of *delirium*, and PCR may be an important predictor in this detection in the elderly. Another significant laboratory test was urea and serum creatinine quantification, which, when increased, were strongly related to *delirium* ( $p=0.006$ ), also associated with *delirium* in other studies<sup>(2)</sup>.

The physical restraint in this study was evaluated in its causal relationship, always before the development of *delirium*. It was significant as a risk factor ( $p < 0.001$ ), corroborating findings of other authors<sup>(7,4)</sup>. Physical containment can be avoided or reduced by chemical containment and the presence of a companion, in addition to proper clinical management. Its indication is medical and can lead to severe iatrogenics<sup>(4)</sup>.

The absence of a companion (for more than six hours/day) was not a risk factor for *delirium*, on the contrary, it was significantly related to the group that did not develop *delirium*. This relationship may imply that the presence of a companion signals an elderly person with greater weakness, which makes him, consequently, more vulnerable to *delirium*.

The patient's disambiguation associated with *delirium* during hospitalization has already been described<sup>(2)</sup>. However, in this study, bed transfers during hospitalization were significant as a protective factor for the elderly with *delirium*, not risk. This behavior can be understood by the fact that most of the transfers of this study were performed from the PS to the clinical wards, that is, from an environment with a higher number of stressors (such as sleep deprivation and others) for a more appropriate environment for hospitalization.

Therefore, the absence of internal transfer was related to longer length of stay in the ER, which may suggest that the exposure of the elderly to this environment was more deleterious and associated with *delirium*<sup>(23)</sup>. It also allows us to reflect on the importance of accommodating the elderly at risk in an appropriate environment as early as possible, since the management of the elderly from the PS to the clinical ward shows a reduction in *delirium*<sup>(24)</sup>.

The access to perception of day and night through natural sunlight through large windows

was evaluated in this study, noting that their deprivation was significantly associated with the group of elderly who developed *delirium*, corroborating other studies<sup>(10,17)</sup>. These findings highlight the importance of physical structure in preventing *delirium*. Patients at risk should have priority in beds with access to sunlight, as well as hospitals should be adequate to this principle, in order to provide such important detail.

The procedures oxygen therapy ( $p=0.004$ ) and bladder catheterization ( $p=0.003$ ) were significantly associated with the development of *delirium*, whereas invasive medical procedures were not associated, and may result from the reduced sample of this variable.

Oxygen therapy was considered when oxygen catheter and/or high flow mask were used. This finding is peculiar, but it meets the risk factor hypoxemia identified in other studies in severe patients<sup>(20)</sup>. Bladder catheterization has also been described by several authors as a risk factor for *delirium*<sup>(25)</sup>, and patients who were catheterized before *delirium* were considered in this study. This procedure implies clinical worsening, associated with *delirium*, in addition to its relationship with infection, discomfort and greater immobility of the patient, and should be used in situations of relevant need to promote better recovery to the hospitalized elderly.

There were several positive correlations regarding the interactions of precipitating factors with each other for *delirium* triggering. Therefore, the intervention in a domain of variables will probably interfere in the reduction and synergism of the factors correlated to *delirium* during the hospitalization of the elderly.

Among the limitations of the study, one can consider the non-inclusion of patients with hospitalization time below 48 hours (77) because of the temporal impossibility for evaluation.

## CONCLUSION

There was an association of *delirium* with worsening prognosis, death and longer hospitalization. Precipitating risk factors were associated: a) longer hospitalization time in the ER, b) physical containment, c) disease severity, d) changes in urea, creatinine and C-reactive protein levels, and) presence of infection; f) deprivation of natural light, g) presence of

companion, h) oxygen therapy, i) urinary catheterization.

The relationship and synergism between risk factors are not fully understood in this study, but converge to a more pronounced risk in the development of *delirium* in the elderly, with greater severity and clinical vulnerability enhanced by environmental risk factors.

The identification of *delirium* requires training and multifactorial look at the patient, family and clinical conditions during hospitalization. Listening to the family or caregiver about the previous history of the neurological picture of the patient is a fundamental factor for a more complete evaluation of *delirium*, especially in the initial period of hospitalization. The reduction in turnover of professionals who follow the patient and the use of neurological assessment tools contribute to a better perception of acute and subtle changes in *delirium* in the elderly.

Advances in pre-hospital and hospital screening and evaluation protocols from the perspective of preventive management of risk elderly and factors associated with *delirium*, in addition to early identification and treatment of *delirium* and acute disease are essential for a probable reduction of in-hospital *delirium* cases. The management of the environment can considerably reduce acute confusional conditions, since they act synergistically with other risk factors that can enhance or reduce the development of *delirium*.

A deeper look of the institutions on these variables is sought through principles that guide and adapt the routines and hospital infrastructure. Enable access of the elderly patient to natural light through large windows, avoid the use of vesical catheters when possible, In addition to accommodating the elderly in less stressful sectors are some viable paths that can considerably impact the improvement of health care for the elderly, with consequent reduction of *delirium*, severity and death. Early hospital discharge reduces exposure to insults characteristic of hospitalization, and may be the difference in the prevention and recovery of *delirium*.

It was observed empirically a probable relationship between longer time (hours and days) of immersion in the confusional picture

and worse clinical evolution compared to cases with shorter immersion time in the confusional picture. This relationship can be investigated in later studies, from the perspective of a potential marker of prognostic evolution.

This study provides, in short, an analysis of risk factors for incident *delirium* in the elderly in a secondary public hospital. New research, according to the regional peculiarities and hospitalization of the elderly in different

realities, can be carried out to compare and bring new findings that may contribute to better detection and intervention of risk groups for *delirium*, in particular through the management of intra-hospital modifiable risk factors, so that their results will promote a reduction in hospital costs, length of hospitalization and morbidity and mortality, recovery and survival of the hospitalized elderly.

## DELIRIUM EM IDOSOS INTERNADOS: AVALIAÇÃO DOS FATORES PRECIPITANTES

### RESUMO

**Objetivo:** Avaliar a associação de fatores precipitantes com a ocorrência de *delirium* em idosos hospitalizados. **Método:** Estudo quantitativo, longitudinal, exploratório realizado em um hospital público do norte do Paraná em pacientes com idade igual ou superior a 60 anos. A amostra coletada foi de 315 idosos, dos quais 67 apresentaram *delirium* durante o estudo. Foram incluídos os pacientes com internação mínima de 48 horas, sendo os dados coletados com o próprio idoso, acompanhante, profissional de saúde ou no prontuário, diariamente, durante a primeira semana de internação ou até a alta hospitalar, transferência, óbito ou diagnóstico de *delirium*. **Resultados:** Na análise de regressão logística, houve associação de *delirium* com os fatores precipitantes: maior tempo de internação no pronto-socorro, contenção física, presença de acompanhante, gravidade da doença, alterações nos níveis de ureia, creatinina e proteína C reativa, presença de infecção; privação de luz natural, uso de oxigenoterapia e cateterismo urinário. Houve 26 correlações significativas entre os fatores precipitantes associados ao desencadeamento do *delirium*. Houve associação de *delirium* com piora prognóstica, maior tempo de internação e óbito. **Conclusão:** Intervenções multiprofissionais controlando a ocorrência de fatores precipitantes poderão contribuir para a redução dos casos de *delirium*, impactando no tempo de internação, morbimortalidades e sobrevida do idoso internado.

**Palavras-chave:** Transtornos neurocognitivos. *Delirium*. Idoso. Fatores de risco. Enfermagem.

## DELIRIUM EN ANCIANOS HOSPITALIZADOS: EVALUACIÓN DE LOS FACTORES PRECIPITANTES

### RESUMEN

**Objetivo:** evaluar la asociación de factores precipitantes con la ocurrencia de *delirium* en ancianos hospitalizados. **Método:** estudio cuantitativo, longitudinal, exploratorio realizado en un hospital público del norte de Paraná/Brasil en pacientes con edad igual o superior a 60 años. La muestra recolectada fue de 315 ancianos, de los cuales 67 presentaron *delirium* durante el estudio. Fueron incluidos los pacientes con hospitalización mínima de 48 horas, siendo los datos recogidos con el propio anciano, acompañante, profesional de salud o en el registro médico, diariamente, durante la primera semana de internación o hasta el alta hospitalaria, transferencia, muerte o diagnóstico de *delirium*. **Resultados:** en el análisis de regresión logística, hubo asociación de *delirium* con los factores precipitantes: mayor tiempo de internación en pronta atención, contención física, presencia de acompañante, gravedad de la enfermedad, alteraciones en los niveles de urea, creatinina y proteína C reactiva, presencia de infección; privación de luz natural, uso de oxigenoterapia y cateterismo urinario. Hubo 26 correlaciones significativas entre los factores precipitantes asociados al desencadenamiento del *delirium*. Hubo asociación de *delirium* con empeoramiento pronóstico, mayor tiempo de internación y muerte. **Conclusión:** intervenciones multiprofesionales controlando la ocurrencia de factores precipitantes podrán contribuir para la reducción de los casos de *delirium*, impactando en el tiempo de internación, morbimortalidades y sobrevida del anciano hospitalizado.

**Palabras clave:** Trastornos neurocognitivos. *Delirium*. Anciano. Factores de riesgo. Enfermería.

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