

The case of B.M.: delirium across different settings of care

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Delirium is a serious acute neuropsychiatric syndrome, characterized by acute and fluctuating inattention, other cognitive deficits, and alterations in level of consciousness, that is independently associated with several adverse outcomes. Delirium is a transdisciplinary condition since it can affect vulnerable people in all settings of care. This clinical case is the basis for a special issue on this topic in which the negative consequence of delirium and the methods to manage people affected by this condition are described across various settings of care.

Key words: delirium, adverse outcomes, geriatric assessment

INTRODUCTION

Delirium is a serious acute neuropsychiatric syndrome, characterized by acute and fluctuating inattention, other cognitive deficits, and alterations in level of consciousness, that is independently associated with several adverse outcomes ¹. Previous studies, carried out in Europe and in Italy ²⁻⁷, found a prevalence of around 20-23% in hospital wards and of 18% and above 30% across rehabilitation settings and nursing home cares, respectively. Delirium is therefore a transdisciplinary condition that can affect vulnerable people across all settings of care. It's also burdened by several negative outcomes, including further clinical complications, worsening of cognitive and functional status, institutionalization, and death ¹⁻⁷. Importantly, specific preventive measures can reduce delirium incidence by 43% compared to usual care ⁸ and commonly used sedatives are ineffective to shorten delirium duration ⁹.

Nonetheless, there is lack of consensus in delirium management across clinical settings.

This clinical case is the basis for a special issue on this topic in which the negative consequence of delirium and the methods to manage people affected by this condition are described across various settings of care.

CASE REPORT

Mr B.M. is a 70-year-old Caucasian male living in Italy. He had a history of smoking (40 pack years) and he has been taking 5 mg of ramipril for the last 8 years due to systolic hypertension and aspirin 75 mg. He is married with Maria and he has two children. He was active and hiking three times a week with his wife and their German Shepherd, Susy. He has worked as a geriatrician in a large non-academic hospital until 2018 when he

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retired. Over the past two years he noticed a progressive difficulty in reminding appointments and driving in the traffic. However, he attributed these symptoms to the social isolation related to the lockdown due to the SARS-CoV-2 pandemic and his recent retirement. However, one day, while walking with his dog and his wife, he was unable to find his way home. After talking to a colleague, at the end of 2020 he accepted to undergo a neuropsychological screening which showed a Montreal Cognitive Assessment (MoCA) score of 23/30. Given his high level of education, he was further tested with a neuropsychological battery showing mild deficits in executive functions, attention and short-term memory loss. He received a brain MRI showing mild small vessel disease and mild generalized atrophy, with a hippocampal volume and ratio reduced by 25%. After a thorough evaluation he reported a positive family history of Alzheimer dementia with his father and paternal grandmother, with a relatively early onset in their 70s. On the beginning of 2021, he was started on 5 mg donepezil without side effects.

At the end of November 2021, his wife found him on the floor of the porch in their garden. At her arrival, he appeared a bit drowsy, unreactive and unable to stand up. Immediately, the wife called the emergency number for a medical intervention and the husband was taken to the Emergency Department (ED). On ED arrival, the nurse placed an indwelling urinary catheter, and the physicians ordered a 12-lead ECG and a brain CT scan, showing a left bundle branch block and no acute ischemic or hemorrhagic signs of stroke. In addition, the physician ordered an X-Ray of the hips, finding a neck fracture of the left femur, and biochemical exams revealing elevated serum levels of C-Reactive Protein and leucocytes. Urine culture was obtained. While the patient was in the ED before being transferred to an orthopedic ward he became agitated and the ED physician prescribed quetiapine b.i.d, and oxycodone/acetaminophen 5/325 mg b.i.d. The patient was then admitted to the orthopedic unit with the following medications: ramipril 5 mg, furosemide 25 mg, atorvastatin 40 mg, aspirin 75 mg, quetiapine 25 mg b.i.d, enoxaparin 4000 UI. Due to the SARS-CoV-2 pandemic family was not allowed to visit him. On the first night he tried to get out of bed, to pull the bladder catheter along with a PICC line; the physician on duty decided to increase the dose of quetiapine and administered diazepam 1 mg i.v. On next morning, the patient was drowsy and not always able to answer questions (he fell asleep while they talked to him) and with a body temperature of 37.5 °C. The respiratory rate was 24 per minute and the blood pressure was 100/60 mmHg. The Quick SOFA score was 3, suggestive of sepsis. A mild desaturation (88%) was found at the pulse-oximeter,

which promptly activated O2 support with 2 l/min. Upon arrival of the blood cultures which were positive for *Escherichia Coli* ESBL +, the infectious disease specialist was called and antibiotic therapy with piperacillin and tazobactam iv was started and continued for 8 days. However, the clinical condition progressively declined and the blood pressure dropped to 70/40 mmHg and he was barely able to move his eyes to a verbal stimulus (modified-Richmond Agitation and Sedation Scale -3). The Intensive Care Unit (ICU)-team was consulted and he was admitted to the Medical where he was started on vasopressors and within 6 hours was intubated due to a progressively decline in his level of consciousness. During the first three days in the ICU was sedated with propofol and fentanyl. Quetiapine was discontinued and he was started on haloperidol e.v titrated to 10 mg given the persistence of visual hallucination. Five days after the ICU admission he was extubated and the vasopressors were discontinued. Given the clinical stability on the 6th ICU day B.M. After surgery he was discharged from the ICU to an internal medicine ward with the following medications: ramipril 5mg, furosemide 25 mg b.i.d, atorvastatin 40 mg, haloperidol 2mg t.i.d., enoxaparin 4000 UI, oxycodone/naloxone 5/2.5 mg b.i.d. During the hospitalization in the internal medicine ward he was not mobilized and the m-RASS fluctuated from +1 to -1.

He was discharged after three days to an in-hospital intensive rehabilitation ward with the following medications: ramipril 5 mg, furosemide 25 mg b.i.d, atorvastatin 40 mg, haloperidol 2 mg t.i.d., enoxaparin 4000 UI, oxycodone/naloxone 5/2.5 mg b.i.d. zolpidem 10 mg. On the first day of the rehabilitation admission, a multidisciplinary and multidimensional assessment was carried out involving a geriatrician, a nurse, a physical therapist, an occupational therapist and a speech therapist. The Barthel Index was 5/100, the patient was delirious (4AT 12/12, m-RASS -1) and with a moderate dysphagia. In the following days the fluctuations reduced, haloperidol and oxycodone were discontinued, and acetaminophen was prescribed for pain control and melatonin to optimize the sleep wake-cycle. The urinary catheter was removed and the 4AT score was 2/12, which meant the absence of delirium. A cognitive screening performed by a psychologist using the Mini Mental State Examination (MMSE) showed a moderate cognitive impairment (MMSE 12/30). During the rehabilitation stay, the functional status progressively improved but there was still significant limitations related to the cognitive deficits (MMSE 15/30). The patient was still dependent in all the activities of daily living (Barthel Index 50/100), but able to get in and out of bed, sit-to-stand-sit from a chair, and walk with assistance (CAS 3/6). A multidisciplinary discharge planning was carried

out and the patient was discharged home after an appropriate training of his wife and with the continuation of physical and occupational therapy at home with the following medication: ramipril 5 mg, furosemide 25 mg, atorvastatin 40 mg, vitamin D/calcium, alendronic acid 70 mg, melatonin 2 mg at night. After three months the patient was admitted to the ED for an acute respiratory failure due to a SARS-CoV-2 bilateral pneumonia requiring a hospitalization in an infectious disease ward. He was treated with dexamethasone 6 mg i.v., high-flow O₂ and antibiotics. During the first days he became agitated at night and he was prescribed with promazine initially 10 mg b.i.d and then given the persistence of agitation 10 mg t.i.d. After 10 days, he was discharged to a subacute unit for clinical stabilization; he was unable to walk and to get out of bed (Barthel Index 0/100). During the 30 days subacute stay he was progressively weaned from the O₂, but he was still unable to walk and dependent in all the ADLs (Barthel Index 0/100). Given the worsening of his functional status after the subacute stay he was transferred to a nursing home (NH) with a urinary catheter, a PICC catheter and pressure ulcer sacrum stage 3, and with the following medications: ramipril 5 mg, furosemide 25 mg, atorvastatin 40 mg, enoxaparin 4000 UI, promazine 10 mg t.i.d. The Comprehensive Geriatric Assessment here performed, confirmed the high level of dependency (Barthel Index 0/100) with a worsening of the cognitive status (MMSE 8/30). His wife was able to see him twice a week given the family visit limitations due to the SARS-CoV-2 pandemic. Given the presence of severe dysphagia and malnutrition he was seen by a speech therapist who indicated a diet with a homogeneous texture with a supplementary nutrition i.v. The NH physician discontinued the atorvastatin and reduced the promazine to 5 mg t.i.d. One month after the NH admission his m-RASS fluctuated between -1 and -2, blood tests were ordered finding an elevated serum C-Reactive Protein and leucocytes. A culture of the pressure ulcer sacrum was positive for multidrug-resistant staphylococcus aureus (MRSA) and he was treated with antibiotics. After an initial response to the antibiotic therapy his clinical conditions progressively worsened, with an m-RASS of -4. Given his prognosis, a shift toward palliative care was agreed by the NH physician and his wife and all the medications were discontinued. Subcutaneous hydration and morphine were prescribed to control discomfort and after few days the patient died.

Conflict of interest statement

The authors declare no conflict of interest.

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Author contributions

AM, GB: conceptualization, writing, draft preparation, review, and editing

Ethical consideration

This is a hypothetical case report, which does not require informed consent by the patients.

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