

Case Study

Utilizing Levine's Conservation Model in the Care of Patient with Lithium Toxicity: Caring Beyond the Symptoms¹

Nikka Lei M. Arellano, RN, Jonas Elmer V. Balneg, RN, Sheri Anne Maximille C. Cabañes, RN,
Leopoldo N. Galan, RN, Kyra Alexa P. Inocencio, RN, Daisy Monica G. Macatangay, RN,
Kristine Cynthia D. Macose, RN, Jihan P. Nepomuceno, RN,
Maureen Marie D. Pizarro, RN, & Tirso Josef Rojas, MAN, RN²

Introduction

Health professionals are trained to recognize and address cues which endanger the client's survival. In critical situations, we focus on ensuring the airway, breathing and circulation (ABC) in order to sustain life. Oftentimes, we feel great in performing dramatic interventions and save our patients from the brink of death. But is this enough? Does our role end here? Is this only how we define good nursing care?

This is the case of DL, a 39 year old female who, upon admission to the pay ward in Philippine General Hospital, presented with respiratory distress, as evidenced by dyspnea and oxygen desaturation, necessitating intubation. Health history revealed the client as a diagnosed case of Bipolar I Disorder for 21 years. The goal of providing holistic care to a patient with a mood-affective disorder presenting with a medical emergency, like DL, poses a crucial challenge - the challenge in going beyond what meets the eye and focusing on human responses and not just the disease process. This case was then selected to serve as a reminder and a learning opportunity that we should not be limited to symptom management, but more importantly, to recognize the totality of the human being, which is the true essence of nursing care.

Assessment

DL is a 39-year old single female who resides in Sto. Tomas, Batangas. She is the eldest among her three siblings and used to live with her grandparents, who spoiled her, until she was 30 years old. She was also considered an achiever and had above-average grades until high school. DL was reported to have difficulty adjusting to her college life. At 18 years old, she started isolating herself from others, lavishly spending money and shouting without any apparent reason. She also had difficulty sleeping. After her family sought psychiatric help for her, she was diagnosed with Bipolar I Disorder. However, DL had poor compliance with her therapeutic regimen. Also, her caregivers had difficulty monitoring DL's

compliance to medications. Eight years later, Lithium Carbonate was added to DL's list of medications.

The patient had her menarche only when she was 18 years old. She did not have any close friends, nor did she belong to any social group. She only had one known romantic relationship. Although she had close relationship with her siblings, DL was reported to be manipulative towards her mother. She wasn't known to be expressive of her problems. Her family had difficulty in her manic attacks and when her manic symptoms would break out, they would immediately resort to admitting her to a private mental health care facility.

¹ Presented by the Department of Pay Patient Services, University of the Philippines – Philippine General Hospital (PGH).

² Adviser: Nurse VI, 5th Floor, DPPS

Two weeks prior to admission, DL had a fight with her mother, causing her to be uncooperative, agitated and restless. On the following days, she stopped taking her medications so she was brought to a private mental health care facility. After a week in the facility, she had episodes of loose bowel movement (LBM) and undocumented fever, with cough and colds. She was also observed to have increasing sleeping time. She then refused to eat and drink, so her family was contacted and she was eventually admitted to a tertiary hospital where she was treated for amoebiasis. Due to the persistence of signs and symptoms, coupled with incoherence and difficulty cooperating, DL's family decided to transfer patient to PGH last February 4, 2011.

The physical assessment of this patient focused on the patient's sensorium, respiratory status and parameters of kidney function. DL was drowsy with a Glasgow Coma Scale (GCS) score of 8 (E2V2M4), with signs of respiratory distress, disoriented and with no regard. Upon inspection, patient had pale conjunctiva and nail beds. She was tachypneic, with apparent use of accessory muscles. Upon auscultation, patient had crackles at bibasal lung fields and rhonchi on upper lung fields. Patient also had productive cough with whitish thick secretions. She was also febrile (T=38.5oC). Patient also presented with fair turgor. She also had indwelling foley catheter, with tea-colored urine.

Baseline Laboratory and Radiologic Exams were taken to assess the client's status. Complete Blood Count showed anemia and leukocytosis which are consistent with sepsis. Arterial Blood Gas shows metabolic acidosis, and blood chemistry revealed electrolyte imbalances and high creatinine levels, highly suggestive of kidney injury. Fecalysis done at previous hospital showed presence of *Entamoeba Histolytica*. Patient's chest X-Ray showed Pneumonia. Other diagnostic exams were unremarkable.

Discussion

Problem Identification and Nursing Interventions

In caring for this patient, Myra Levine's (1967) Conservation Model served as the basis of the nurses. This model views the person as a holistic being, responding wholly and completely to every alteration in his or her life pattern. Therefore the goal of nursing is to promote adaptation and maintain wholeness using the principles of conservation (Energy, Structural Integrity, Personal Integrity and Social Integrity).

The significant findings were indicative of inadequate oxygenation thus requiring immediate interventions. Patient's history and physical examination led to the admitting impression of Encephalopathy probably secondary to Severe Sepsis secondary to Aspiration Pneumonia. Due to the effects of electrolyte imbalances, client had a decrease in sensorium predisposing her to aspiration. This then eventually led to pneumonia. Pneumonia is defined as the inflammation of the lung parenchyma (Porth, 2005). This inflammatory reaction produces exudates that interfere with the diffusion of oxygen and carbon dioxide, causing a ventilation-perfusion mismatch (McCance and Huether, 2014). Thus the nursing problem of ***Impaired Gas Exchange related to ventilation-perfusion imbalance secondary to Pneumonia*** was selected. This encompasses interventions that address not only problems with gas-exchange, but also with airway and ventilation. Priority was given to this problem because ensuring respiratory function is a primary nursing task critical in sustaining life (Kozier, 2008). Our goal was to establish adequate oxygenation and resolve aspiration pneumonia. Ultimately, this would prevent development of complications. An improvement of oxygenation and ventilation as evidenced by absence of respiratory distress, normal blood gas levels and oxygen saturation, and improvement in sensorium was warranted for our client DL.

After incubation and consequent interventions on Ventilation Assistance, our nursing interventions focused on addressing and preventing complications of pneumonia. This was done through Airway Management and Respiratory Monitoring. Antibiotics were given as ordered, to treat lung infection causing sputum production, addressing her impairment in gas exchange. Our responsibility here is to understand the rationale for these medications. Her response to the interventions was then observed and vital signs were continuously monitored.

So, initial septic management was done. However, despite aggressive antibiotic therapy, the patient remained febrile with persistence of other symptoms. So what exactly is happening to DL? The health care team was then faced with the challenge to identify and address other possible etiologies.

Remember that DL was diagnosed with Bipolar I Disorder and took Lithium for about a year prior to admission, with poor compliance and without any lithium

level monitoring done. It was only during the admission at a previous health facility that she was able to regularly take lithium. Patient also had episodes of loose bowel movement which led to loss of fluid and electrolytes. As reabsorption of lithium increases in individuals who are hyponatremic or volume-depleted, as in DL's case, lithium level was obtained. And indeed, her serum lithium was elevated. With lithium's very narrow therapeutic index, toxicity is very likely to occur (Jasleen Gill, 2003; Lee, 2010). Lithium salts bind to the receptor sites and are absorbed more by the kidneys instead of the lost electrolytes, causing build-up of lithium. Lithium also decreases water resorption and increases sodium and potassium elimination (Lederer, 2012) thereby forcing the body to compensate by decreasing blood flow to the kidneys, leading to kidney injury.

Based on the cues, the diagnosis most appropriate to address these problems is **Potential Complication: Renal Failure**. Lithium Toxicity is a medical emergency that warrants collaboration with physicians and other members of the health care team (Smeltzer et al, 2010). A potential complication is Renal Failure and measures must be taken to prevent it. This can be achieved through addressing Lithium Toxicity, thereby improving renal function, as evidenced by normal fluid balance and normal serum electrolyte levels.

While the problem on gas exchange was being addressed, interventions on Fluid and Electrolyte Management were also done. DL's intake and output were accurately monitored to determine fluid loss and need for replacement. Furthermore, to correct fluid and electrolyte imbalance and facilitate excretion of excess lithium in blood, intravenous fluid therapy was administered per physician's orders. In theory, forced diuresis using normal saline should increase lithium clearance by decreasing proximal reabsorption (Glen Markowitz, 2000). While administering normal saline, free water flushing was given per nasogastric tube to prevent hyponatremia.

Gradually, her symptoms were resolved. After two weeks, she was able to tolerate weaning and was eventually extubated. In addition, her electrolyte levels normalized. Her sensorium had also greatly improved. But do we stop here? Another challenge then arises for us, how do we ensure that history will not repeat itself?

To address this challenge and taking Levine's Conservation Model in mind, the patient's personal and social integrity must be focused on. And in order to provide

holistic care for DL, our nursing care focused on three goals: how to address the crisis she faced, how to prevent further complications of the cause of the crisis, and how to prevent all of this from happening again. And this is where the challenge lies. The mental illness will require its own treatment and management, but the focus must be on what we can do. Therefore, as nurses, we can help address the problem of **Ineffective Therapeutic Regimen Management (Individual and Family) related to (1) Knowledge Deficit, (2) Complexity of Therapeutic Regimen**.

We must focus in the long-term goal in that she and her family would be able to integrate a program for the treatment of her Bipolar disorder into her daily living pattern and family process. The goal was for them to develop skills, knowledge and attitudes that would enable them to perform effective therapeutic management at home. Health teaching was then done with the client's significant others about medications. This aimed to broaden their knowledge and enable them to anticipate and detect possible problems and early signs and symptoms of drug toxicity that may necessitate readmission. In addition, collaboration with DL's doctors was done to ensure that the client will receive psychotherapy regularly after discharge. Also, assessment of the involvement of other systems such as social services, health care facility and providers was done. A written health commitment contract, signed by the doctor, nurse, client and responsible caregiver/s to reinforce adherence to plan of care was also devised.

Evaluation and Recommendations

After further nursing and medical interventions, the patient was discharged on room air, ambulatory, voiding freely with a positive fluid balance, conscious and coherent with a GCS score of 15, has optimal level of functioning and good outlook in life. Last we heard, she is tending to the family's sari-sari store and goes to her follow-up with her psychiatrist.

Our duty to our patients does not end upon the resolution of their symptoms. The essence of our care should extend beyond their hospital stay. Our presence should be felt in home care through our reminders and instructions which we give prior to discharge. Therefore, we would like to suggest the following: (1) Revision of the discharge instructions form for the patient and the family, which will be accomplished by every member of the health team and will consolidate each service's home instructions; (2) Development and utilization of Commitment Health Contract, to be signed by the patient, relative, nurse and

doctor which aims to reinforce adherence to therapeutic management; (3) Establishment of a psychiatric nurses' core group and (4) Conduction of trainings and seminars to improve the nurses' skills in providing holistic care towards quality of life.

Often we take this for granted but it is through proper health education and the nurses' skill to anticipate potential problems at home that we prevent the same problems from arising again. Through health education, we empower our patients and their family to take control of their condition and move forward towards the improvement of their lives.

In this age of modernity where we are predominated by medical breakthroughs, we appeal to each and every one of you to go back to our roots. Let us remind ourselves, what is really the essence of nursing? Is it the complexity of our interventions? True and effective nursing care comes from the heart. It can only be through genuine concern and compassion that we can make a difference in their lives. Nursing is seeing the human in our patients. And though they come to our aid broken, hurt and ill, we nurses can help make them whole – because we, nurses, are the fulcrum of multidisciplinary care. This is the challenge we face: to emulate care that transcends enough to make a mark in our patient's life.

References

- Glen Markowitz, J. R. (2000). Lithium Nephrotoxicity. *Journal of the American Society of Nephrology*, 11(8), 1439-1488. Retrieved from <http://jasn.asnjournals.org/content/11/8/1439.full>
- Jasleen Gill, H. S. (2003). *Acute Lithium Intoxication and Neuroleptic Malignant Syndrome*. *Pharmacotherapy*, 23(6), 811-815.
- Kozier, B., Erb, G., Berman, A., & Snyder, S. (2008). *Fundamentals of Nursing: Concepts, Process and Practice*. New Jersey: Pearson Education, Inc.
- McCance, K. L., & Huether, S. E. (2014). *Pathophysiology: The Biologic Basis for Disease in Adults and Children (7th ed.)*. St. Louis, MO: Elsevier Mosby.
- Lederer, E. (2012). Lithium Nephropathy. Retrieved from <http://emedicine.medscape.com/article/242772-overview>
- Lee, D. C. (2010). Lithium Toxicity. Retrieved from <http://emedicine.medscape.com/article/815523-overview#a0104>
- Porth, C. (2005). *Pathophysiology: Concepts of Altered Health States (7th ed.)*. Philadelphia, PA: Lippincott Williams & Wilkins.
- Smeltzer, S. C., Bare, B. G., Hinkle, J. L., & Cheever, K. H. (2010). *Brunne & Suddarth's Textbook of Medical-Surgical Nursing (12th ed.)*. Philadelphia, PA: Lippincott Williams & Wilkins.

from page 23

- Spradley, J., & McCurdy, DW. (1972). *The Cultural Experience: Ethnography in Complex Society*. Chicago, USA: Science Research Associates, Inc.
- Wen, Ya-Hui, (2012). Religiosity and Death Anxiety of College Students. *The Journal of Human Resource and Adult Learning*, Vol. 8, Num. 2, December 2012, pp98-106
- Valenzuela, D. (2005). *Interview as a Method for Qualitative Research*. Retrieved March 10, 2012, from <http://www.public.asu.edu/~kroel/www500/Interview%20Fri.pdf>
- Videbeck, S. L. (2006). *Psychiatric Mental Health Nursing (3rd edition ed.)*. Philippines: Lippincott Williams & Wilkins.

About the Author: Carlo Paul C. Sana, MAN, RN, is a Professor, Research and Extension Coordinator, and Accreditation Coordinator of Virgen Milagrosa University Foundation – Graduate School. He is a Research enthusiast and is an active member of various research institutes and organizations. He has also received several awards relative to the conduct, presentation, and publication of this study, notably the Platinum Award for having the Best Research Paper, and the Best in Multimedia Presentation Award during the 10th Dr. Martin Posadas Memorial Research Forum; the aforementioned study also garnered 3rd place – Best in Oral Presentation during the Region I Health Research and Development Consortium (R1HRDC) Regional Research Contest & Research Dissemination Forum in July 2014. At present, he is working on a number of researches intended for national development.

“BY INCREASING EMOTIONAL INTELLIGENCE, NURSES RAISE THEIR AWARENESS SO THEY CAN MAKE BETTER CHOICES IN THE FUTURE. THIS PROCESS ENHANCES NURSES' ABILITIES TO HAVE EMOTIONAL INTELLIGENCE INFORM THEIR PRACTICE.”

Sherwood & Horton-Deutsch, 2012, p. 23