Smoking Withdrawal and Prolonged Hospitalization

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Case Study

L.C. is a 40-year-old Caucasian male diagnosed with relapsed non-Hodgkin’s lymphoma who was admitted to the hospital for high-dose chemotherapy followed by an autologous peripheral stem cell transplant (PSCT). His hospitalization became complicated when he developed Aspergillus pneumonia, a fungal respiratory tract infection commonly diagnosed in immunosuppressed patients. He is a heavy smoker who refused any medical interventions to assist him in tobacco withdrawal during his shortened three-week hospitalization. He left the unit often to smoke outside in the designated smoking areas when he felt well and was mobile. Eventually, he required numerous medications to alleviate his nausea and, as a result, became sedated. One of the nurses coincidentally found him in the bathroom with a lit cigarette and observed that he appeared drowsy. He then became agitated with all of the nurses when they requested he refrain from smoking in his room. His behavior became difficult to manage. L.C. ultimately left against medical advice and, upon leaving the hospital, he remained neutropenic and thrombocytopenic. He was followed on an outpatient basis and recovered well after his transplant, despite his expected poor outcome.

Introduction

Many people enter the healthcare system and require prolonged hospitalization for treatment of their diseases. Smoking cessation is difficult enough without the added burden of having to quit prior to a stressful hospitalization. Many individuals, particularly people with cancer, who are forced to comply with smoke-free policies often develop behavioral health morbidity, such as anxiety, depression, and aggression (Moadel, Lederberg, & Ostroff, 1999). Despite the overall trend to reduce lengths of stay and healthcare costs, many patients still require prolonged hospitalizations. Tobacco addiction often is overlooked or receives low priority when these individuals are admitted to the hospital.

Epidemiology

According to the American Heart Association (AHA), approximately 26 million men and 23 million women in the United States are smokers (AHA, 2000a). In addition, approximately four million teenagers are smokers, which the AHA (2000a) believes is most likely a gross underestimate. The American Lung Association (ALA) estimated that smoking-related diseases claim approximately 430,700 American lives each year (2000c). Smoking remains the most preventable cause of premature death as approximately 10–12 million smokers ultimately die prematurely from smoking-related diseases (AHA, 2000d). This statistic translates into one in three smokers dying early (ALA, 2000c). In 1993, the Environmental Protection Agency declared that environmental tobacco smoke is a known carcinogen and secondhand smoke is responsible for causing significant morbidity and mortality in people who choose not to smoke, especially children (AHA, 2000b). As a result of these findings disseminated by the U.S. Surgeon General and in accordance with local, state, and national clean indoor air laws, many institutions and organizations have adopted smoke-free policies. These smoke-free settings undoubtedly contribute to saving lives, reducing healthcare costs, and improving safety issues (Longo et al., 1996). Hospitals are no exception to this rule, especially because they are responsible for the safety and well-being of patients, their families, visitors, and employees. Fire hazard risk and potential injury make it necessary to prohibit smoking in hospitals and other public settings.
Pathophysiology

Cigarette smoking has been linked in the development of numerous malignancies. Cancers of the head and neck, esophagus, lung, pancreas, liver, kidney, and urinary bladder are diagnosed in significantly more smokers than nonsmokers (American Cancer Society [ACS], 2000). Tobacco smoke initiates or causes cellular DNA alterations that may become irreversible. This smoke also acts as a promoter or irritant to transform hyperplastic cells into malignant cells, as in the case with ciliated epithelial cells changing to stratified squamous cells in the bronchus. Substances, such as nicotine, phenol, nitrosamine, tar, polycyclic aromatic hydrocarbons, and other chemicals that constitute tobacco or are contained in the smoke released, are associated with carcinogenesis and tumor promotion (Kumar, Cotran, & Robbins, 1997a, 1997b). Apart from these direct cellular effects, chronic exposure to tobacco smoke plays a significant role in inhibiting certain fundamental cells of the immune system, specifically natural killer cells and lymphocytes, such as T and B cells (Sopori & Kozak, 1998). T cell unresponsiveness is well known in the reduction of the immune system’s ability to recognize malignant cells that express self-antigens, whereas poor natural killer cell function limits surveillance and removal of these metastatic cells (Bauer, 2000). B cells often work in conjunction with T cells while making antibodies to foreign substances.

In addition to triggering cancer, cigarette smoking has been well documented in causing and worsening many serious medical conditions affecting the cardiac, respiratory, and gastrointestinental systems, among others. Figure 1 identifies common diseases linked to tobacco smoke. Nicotine is the substance present in cigarettes that contributes significantly to addiction. When cigarette smoke is inhaled, nicotine is carried in the smoke and enters the bloodstream after diffusing through the thin layer of cells in the alveoli found in the most distal portions of the lungs. Nicotine temporarily increases blood pressure, heart rate, and cardiac output, as well as generates a sense of euphoria. Nicotine achieves these effects through increasing the release of dopamine by stimulating the nicotinic receptors found on many neurons (Remnard, 2000). This action releases dopamine into the synaptic gaps where it then can stimulate the next neuron. Nicotine narrows the arteries and increases the amount of free fatty acids, glucose, and various hormones in the blood, placing individuals at risk for thromboses and emboli (AHA, 2000c). Cigarette smoke significantly increases gastric acid secretion, which alters the balance between acid and mucus and contributes to severe gastrointestinal symptoms. Carbon monoxide is present in the inhaled smoke and binds to the hemoglobin in the blood. This high affinity to hemoglobin reduces the amount of oxygen that can be carried in the blood and supplied to the tissues without regard to the body’s oxygen demands (AHA, 2000c). Carbon monoxide also has been found to damage the inner linings of the arteries, leading to fatty deposits, inflammation, and calcification, which contribute to arteriosclerosis (AHA, 2000c).

Nursing Management

Nurses are in a key position to identify, implement, and facilitate tobacco withdrawal interventions. Nursing care includes implementing smoking withdrawal strategies for individuals who will be hospitalized for long periods of time. An important first intervention is to assess and identify potential smokers who are at risk for developing withdrawal symptoms given the approximate time that they will be hospitalized (Hecht et al., 1994). People who smoke heavily tend to exhibit withdrawal symptoms more quickly. An initial screening should be obtained while the patient is being admitted to the inpatient unit. The assessment should include whether the patient smokes and, if so, what the patient smokes, how often and for how long, what brands, what tar content, and if the patient engages in related behaviors (e.g., chewing tobacco). Further assessment is necessary to gain an understanding of the degree of tobacco addiction, coping mechanisms, and other potentially harmful behaviors, such as alcohol and illicit drug use. Nurses should be aware of their own personal feelings and beliefs concerning addiction in general and tobacco addiction specifically. Healthcare team members should not allow their personal views or judgments of the patient to interfere with their care of that patient.

Next, nurses should communicate pertinent information to the physicians and advanced practice nurses (APNs) responsible for the patient’s care. Physicians and APNs are able to prescribe substances and refer patients to behavioral therapies that foster temporary or long-term smoking cessation. Nurses should be able to recognize the signs and symptoms of nicotine withdrawal that are identified in Figure 2. Abrupt withdrawal from cigarettes, such as quitting “cold turkey” without nicotine supplementation, often manifests into feelings of increased tension, fatigue, and vulnerability to starting up again (Cinciripini, Cinciripini, Wallfisch, Haque, & Van Vunakis, 1996). Nurses at the bedside should be able to react quickly to potentially threatening situations when a patient becomes agitated or aggressive as a result of nicotine withdrawal. A multidisciplinary team approach with consistent reinforcement is the key to managing situations successfully before they escalate.

Staff and Patient Education

Staff and patient/family education is an important nursing intervention. Addiction is a very complex process that often entangles physical, psychological, and habitual behaviors. Physical dependence implies that the body and brain crave nicotine on a regular basis. Addiction also conveys this physical and psychological need for nicotine on a regular basis. Habitual addiction becomes the most difficult to break because the individual’s past smoking behaviors have become a daily routine. Habitual smoking becomes reinforced positively over time and develops into conscious and unconscious
patterns or lifestyles. Staff education is key because treatments reinforced by nurses at the bedside strongly benefit individuals in the quitting process (Wewers, Ahijevych, & Sarna, 1998). Important features of individualized smoking cessation in accordance with guidelines proposed by the Agency for Healthcare Research and Quality in the United States include asking about smoking at every opportunity, advising all smokers to stop, assisting smokers in stopping, and arranging follow-up care (Raw, McNeill, & West, 1999).

Nurses must instruct and consistently reinforce the prescribed therapy to assist in modifying tobacco addiction. Patients should be advised that the hospital is a smoke-free environment because oxygen and other substances present in most hospital rooms are highly flammable. Some hospitals allow patients to smoke in their rooms or in designated areas with a physician’s order that is in accordance with Joint Commission on the Accreditation of Healthcare Organizations’ requirements for 2000. Cigarette confiscation is rarely appropriate except in special circumstances when the patient has an underlying psychiatric illness or threatens to harm himself/herself or others. Patients should be reminded that the benefits of smoking withdrawal may include improved respiratory function, increased activity tolerance, and a sense of personal accomplishment (Hecht et al., 1994). Additional benefits include diminishing cigarette stains on fingers, reducing hacking coughs, and eliminating the smell of cigarette smoke on clothing, as well as improved senses of smell and taste (ALA, 2000c). Over time, the cardiac, respiratory, and gastrointestinal systems have the potential to recover, unless irreversible damage already has been done, such as with lung cancer. The risk of developing associated diseases lessens with each passing minute away from cigarettes (ALA, 2000c). Healthcare professionals should warn women to avoid smoking while taking oral contraceptives because of the significantly increased risk of developing thromboembolic disease (Schiff et al., 1999). Pregnant women should be given firm and clear advice to stop smoking during pregnancy to prevent serious birth defects and other abnormalities (Raw et al., 1999).

### Pharmacologic Agents

Six medications (see Figure 3) commonly are used to assist patients in refraining from smoking or smoking cessation. Nicotine gum, nicotine patches, nicotine nasal spray, nicotine inhaler, bupropion, and alprazolam can be offered. Nicotine gum is available over the counter with a recommended treatment period of 12 weeks consisting of 10–15 pieces of gum per day (ALA, 2000a). Nicotine gum is supplied in 2 mg pieces for those who smoke fewer than 25 cigarettes per day and 4 mg pieces for those who smoke 25 or more cigarettes per day. The package instructions illustrate the proper way of chewing the gum and identify foods and beverages to avoid near the time of use. If the nicotine patch is preferred, one patch is applied on a preferably dry, hairless part of the upper body (usually shoulder) once a day for 6–10 weeks of treatment (ALA, 2000c). Only one patch should be worn at any given time during the day or night. Similarly, patients should be advised not to smoke while wearing the nicotine patch to minimize the risk of developing hypertensive crisis. Common side effects of nicotine patches include headaches, dizziness, blurred vision, weakness, upset stomach, and diarrhea. Nicotine nasal sprays and nicotine inhalers are two alternative forms of nicotine replacement therapy (NRT) that currently require a prescription (ALA, 2000a). Bupropion is a daily non-nicotine antidepressant medication available by prescription that benefits smokers by minimizing the symptoms of abrupt withdrawal (ALA, 2000a). Common side effects of bupropion include seizures, headaches, agitation, tremors, insomnia, dry mouth, nausea, and vomiting. Alprazolam is a sedative/hypnotic (benzodiazepine) medication available by prescription that acts at many levels in the central nervous system to produce an anxiolytic effect by potentiating gamma aminobutyric acid. Common side effects of alprazolam include dizziness, drowsiness, and lethargy.

NRT and bupropion consistently have been found to double cessation rates when compared to controls with or without behavioral therapy (Hughes, 2000). NRTs also are safer than smoking cigarettes because they do not contain tars or poisonous gases and they generally supply less nicotine (ALA, 2000c). Each product is individualized to the patient; a product that works well for one patient may not work as well for another. Cigarette smokers also may have an oral fixation. Nurses indicate that hard candies, gums, or mints can be a safe alternative to smoking while on NRT. Exercise, adequate sleep, and a well-balanced diet with a sufficient amount of water are important when an individual abstains from smoking to reduce stress, improve coping abilities, and promote a healthy lifestyle (ALA, 2000c).

### Behavioral Approaches

Emotional states have been linked to tobacco addiction. Behavioral modification strategies that supplement medications have been found to increase cessation rates once the physical addiction is overcome (ALA, 2000c). Heavy smokers appear to benefit the most from behavioral therapy. Behavioral modifications are difficult and, as a result, the patient requires consistent psychosocial support and guidance to be successful. Typically, smokers do not engage in health-promoting lifestyles when compared to nonsmokers (Boyle, O’Connor, Pronk, & Tan, 2000). Therefore, identifying alternative coping behaviors to manage stress is helpful. Identifying a support person at home, preferably a nonsmoker or successful former smoker, also can be a useful strategy. Many

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**Figure 2. Signs and Symptoms of Nicotine Withdrawal**

Note. Based on information from the American Lung Association, 2000a; Gritz, Fiore, & Henningfield, 1995.

<table>
<thead>
<tr>
<th>Sign/Symptom</th>
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<td>Irritability</td>
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<td>Impatience</td>
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<td>Hostility</td>
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<td>Agitation</td>
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<td>Restlessness</td>
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<td>Decreased heart rate</td>
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<td>Increased appetite/weight gain</td>
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<td>Seeking behaviors</td>
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<td>Headache</td>
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<td>Anxiety</td>
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**Figure 3. Current Pharmacologic Smoking Cessation Therapies**

Note. Based on information from Hughes, Goldstein, Hurt, & Shiffman, 1999.

Nicotine patch—Nicotine is absorbed through the skin into the bloodstream via a transdermal patch. Nicotine gum—Nicotine is absorbed through the lining of the mouth into the bloodstream. Nicotine nasal spray—Nicotine is absorbed through the nasal lining into the bloodstream. Nicotine inhaler—Nicotine is absorbed through the lining of the mouth into the bloodstream. Bupropion—This is an antidepressant oral medication used to alleviate abrupt withdrawal symptoms. Alprazolam—This antianxiety oral medication can be used adjunctly with behavior modification during the withdrawal process.
support groups exist that can facilitate long-term therapy and assist the individual in achieving tobacco cessation. Group therapy offers the best chance for cessation, followed by self-help and other less intensive interventions (Moller & Tonnesen, 1999). Group therapy works well because individuals are taught to motivate each other to quit and refrain or abstain from smoking.

Nurses should recognize that only about 20%–40% of people who use smoking cessation programs successfully abstain from cigarettes for one year (AHA, 2000d). Relapse is common and occurs as a result of many factors, including reduced will power and increased feelings of stress and anxiety. Success rates generally increase with successive attempts to quit smoking. Tobacco addiction is very complex in nature, and an individualized approach to treatment should be considered. Individuals smoke for many personal reasons, such as for stress management and relaxation, weight control, and social belonging. They also may possess poor will power or a strong physical addiction that has developed from simply enjoying smoking (ALA, 2000b). These individuals need to admit to themselves that an addictive problem exists and that they must find the motivation to quit successfully. Knowing why individuals smoke is an asset to healthcare providers when addressing behavioral smoking cessation issues.

Follow-up and referral are key issues that traditionally were the physician’s responsibility after his or her patient was discharged from the hospital. More recently, APNs, case managers, and experienced clinicians have played instrumental roles in promoting continuity during a patient’s smoking cessation efforts. Follow-up remains the most difficult time to help the patient quit because of many factors, such as returning to the workplace or being surrounded by friends and family who smoke. It is virtually impossible to positively affect an individual’s behavior and attitude without identifying all aspects of his or her life that may act as potential barriers to smoking cessation. Consistent advice from healthcare providers is effective in motivating smokers to attempt to quit (Raw et al., 1999). Referral to a smoking cessation specialist is appropriate if and when the patient requests help in quitting. Numerous resources are available through the AHA, ALA, and ACS that support patients during smoking withdrawal.

Conclusion

Tobacco addiction is extremely powerful as it tends to envelop physiological, psychological, and habitual factors into each patient’s illness. Smoking cessation is very difficult to accomplish and is an unrealistic goal when patients require prolonged hospital stays and are placed under additional stress. Nurses can provide a supportive environment in assisting individuals who must comply with hospital smoking and safety policies. Nurses need to keep abreast with information regarding tobacco addictions. By incorporating new research findings (e.g., effective nicotine replacement, pharmacotherapy, behavioral modification), nurses can maximize the healthcare team’s treatment plan by identifying, educating, implementing, and evaluating each patient’s response to nicotine withdrawal treatment.

The goal of nursing care can be met by actively pursuing these areas of concern and establishing a mutually agreed upon plan of care prior to and during hospital admission. In doing so, difficult situations may be avoided and patient safety maximized during this stressful period. Nurses should anticipate behavioral changes when the patient experiences tobacco withdrawal. Nurses should identify high-risk patients, anticipate coping difficulties, and be informed about how to manage problematic situations before they arise. The entire nursing process must be actively engaged in the goals of a smooth transition from nicotine use and abuse to withdrawal and possibly long-term cessation.

Analysis of Case Study

L.C.’s case was not managed optimally because of a lack of knowledge and a lack of consistent reinforcement on the part of the healthcare team. This experience illustrated that nurses often are unprepared and ill equipped to assess and manage the needs of heavy smokers. L.C.’s case could have reached a more therapeutic outcome if the hospital staff had identified him early in his hospitalization for potential behavioral changes resulting from cigarette withdrawal. The healthcare team needed to be consistent in establishing a mutually agreed upon plan. A thorough smoking assessment and psychological screening prior to PSCT may have identified potential problems related to his smoking history and may have deemed him an inappropriate candidate for such an invasive and potentially life-threatening therapy.

L.C. was undergoing a PSCT that required many cytotoxic agents prescribed based solely on his height and weight. A factor that was not addressed was the possibility of nicotine (a well-known vasoconstrictor and bronchoconstrictor) interfering with the prescribed drugs’ bioavailability, distribution into affected tissues, and basic pharmacokinetics. Nicotine may have increased or decreased the intended effects of the chemotherapy resulting in outcomes that could potentially have altered his response to treatment or even directly or indirectly caused his death. However, most oncologists and APNs do not make dosage adjustments based on a patient’s smoking status. To date, L.C. has recovered fully from his Aspergillus infection and his bone marrow function has returned to normal. Moreover, he has no evidence of lymphoma, yet he continues to smoke.

References

Smoking withdrawal often is overlooked or receives low priority from healthcare providers when patients who smoke require lengthy hospital stays. Smoking has been linked to numerous cancers and to many diseases affecting the cardiac, respiratory, and gastrointestinal systems. Smoking cessation in heavy smokers during a stressful hospitalization is not a realistic goal, and measures to promote compliance must be sought. Four nicotine replacement options as well as two prescribed medications that support behavioral modification are available to individuals to alleviate smoking withdrawal and promote smoking cessation. Oncology nurses play a key role in identifying high-risk patients, addressing important safety issues through communication, and establishing mutually agreed upon plans of care in the management of smoking withdrawal therapies. Nursing interventions that include consistent reinforcement, education, and psychosocial support ultimately will result in better patient outcomes and provide a safer hospital environment.