

Adult Health Case Study

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R. J. is a fifty-three year old male who arrived at the emergency room on October 29. He arrived because of a wound on his right toe which had become gangrenous and necrotic. He had cellulitis in the same foot, and has a history of diabetes type two and hypertension. He stated he had not taken insulin for the past seven months, and had an initial blood glucose of 491. He came into the emergency room because of seeing a nurse on the street and showing her a picture of his foot, which she suggested he seek immediate medical attention. Due to his uncontrolled diabetes, he has impaired tissue perfusion, and the uncontrolled diabetes is thought to be a result of non-adherence. Towards the end of the shift, R. J. went down to the operating room in order to have an incision and debridement of his right toe.

Medical Diagnoses

R. J. presented to the hospital due to an ulcer and gangrene of his right foot. The ulcer was on the great toe, with erythema and swelling throughout the distal third of the foot. He claimed to have a zero out of ten on a numeric pain scale, which is a typical finding in patients with diabetes and neuropathy, a common complication of diabetes. Diabetic foot ulcers begin with a wound in the foot, and due to the neuropathy, the patient may not realize they have an ulcer, as the ulcer continues to worsen. The nerve damage is caused by the increased glucose in the blood, which creates a higher viscosity and causes the peripheral nerves to not have adequate blood flow (Hinkle & Cheever, 2014).

Patients with diabetic neuropathy and gangrene of a foot ulcer typically present with a wound on an area of the foot that is prone to pressure, and due to the loss of sensation, many do not assess their feet or seek medical assistance until it has redness, swelling, gangrene and/or drainage. Due to the infection, blood sugar levels are also likely to be raised as the body

responds. In the case of R. J., he presented with gangrene on his right great toe, which was the site of the ulcer. His right foot also appeared to have infection surrounding the toe. The distal third of his right foot had redness and increased swelling compared to the left foot. No drainage was visible upon assessment. His glucose levels were also increased, and were more elevated than his expected levels according to his A1C level. He presented to the emergency room with a blood glucose of 491, but over twenty four hours he decreased to 215. His A1C was 10.9, which correlates to an average in the low 300s (Hinkle & Cheever, 2014).

Nursing Diagnoses

R. J. has impaired tissue perfusion related to the increased blood glucose levels and hypertension. This has manifested as redness and swelling in the foot, and the lack of blood flow is evident in and around the wound. There was no discharge, and the gangrene was caused by a lack of blood flow. This is the highest priority because the lack of oxygenated blood flow is the cause of the other medical diagnoses. Due to the lack of perfusion, the skin has had decreased integrity, which makes him more susceptible to infection. The injury also has impaired his mobility. This is the first aspect of his environment that must be changed in order to help the healing process according to Nightingale's environment model.

Due to numerous factors, including deficient knowledge and lack of access, R. J. was unable to adhere to the recommendations for people with diabetes. He admitted not using insulin for the past seven months due to the cost of the medication. Upon discussion with R. J. it became clear he either did not understand the importance of diet and exercise in diabetes management or he was nonadherent to the dietary restrictions, and did not understand fully when he should seek medical attention. According to Johnson's behavioral systems model, the nurse's role is in caring

for the behavioral system, so it is important to address the psychosocial aspects that caused the problem and injury to precipitate. It also relates to Neuman's systems model; it is important to look at the whole patient, including his psychological and sociocultural role. Due to his nonadherence, he had an exacerbation of a chronic illness.

As previously stated, the decreased tissue perfusion led to impaired skin integrity, as evidenced by redness and swelling of his foot, and an open ulcer on his right great toe. The impaired integrity is related to decreased perfusion and the initial injury, which was not treated, most likely because of neuropathy. This led to the condition of the foot worsening, and has increased the risk of further infection. The impaired skin integrity must be addressed in order to create wellness in the patient's system.

The impaired skin integrity is related to the increased risk of further infection. It is presumed the toe has an infection between the gangrene and necrosis, and the wound also means the first barrier, the skin, is broken. The infection is evidenced by a white blood cell count of 16.2, neutrophil count of eighty, and lymphocyte count of fourteen, which are all elevated. It is important to return R. J. to his previous level of health, and without infection, in order to return him into his baseline system and ensure he is able to return to his daily life.

The impaired skin integrity of his foot has caused him to also try to adapt to changes. R. J. closely follows the adaptation theory, but it is because he has been living with the ulcer, so he has had changes in his mobility. These changes are related to compensation, his gait became less steady because he began to walk on the outside of his feet to avoid putting pressure on it. His unsteady gait also made him at an increased risk for injury, which then feeds back into the previous diagnosis.

Outcomes

The primary outcome for R. J. is to have a return of proper blood flow and tissue perfusion to his right foot and understand the lifestyle changes necessary for diabetic patients. He needs better blood flow in order to start the healing process. This will be seen by decreased redness and swelling on the right foot, increased strength of pedal pulses, and the healing of the wound. Before these outcomes are achieved, his blood glucose level should be stabilized. His blood sugar should return to normal levels within thirty hours, after he has been able to eat dinner. His circulation should improve with pedal pulses within two days, and the swelling should begin to decrease in the next twenty four hours.

He also needs to be assessed for better possible adherence. He should be able teach back the dietary and lifestyle changes he needs to make before his discharge. He should be able to name half of the changes within the first day, and reassessed as the stay continues, making sure he has fifty to seventy-five percent of the changes listed. He will also need to perform proper foot care in front of the nurse before discharge.

Literature Review

Gorina, Limonero, and Alvarez examined the literature pertaining to educational interventions (2018). In order to do this, they performed a systematic review without a meta-analysis of twenty studies. Of the studies, only one was found to have little to no bias, and the majority had a moderate risk of bias. Due to the various levels of bias and inconclusive results, it was found continued study is needed to determine the most effect ways of educational interventions for people with chronic noncommunicable diseases such as diabetes. The results were deemed inconclusive due to the various measurement and evaluation techniques used

during the studies, so it was difficult to compare them. Although further research is necessary, it helps to begin the process of finding useful education interventions. One of the major aspects included education on decreasing modifiable risk factors such as smoking and nutritional decisions, both of which were areas R. J. needed more education on.

Before performing such educational interventions, it is important to assess the patient's health literacy skill and likelihood of neuropathy from diabetes mellitus type two. It was a case-controlled study with 114 participants that answered a questionnaire. The study found the primary reasons for developing neuropathy was a lack of understanding of diabetes and elevated A1C levels (Chen, Lin, Chang, Wang, Hung, & Tzeng, 2018). Due to the findings of this study, it is important to assess R. J.'s health literacy and understanding, which could be a large factor in his nonadherence. He also had elevated A1C levels, he had 10.9 when the goal for diabetic patients is below seven (Hinkle & Cheever, 2014). He needs to have a foot care routine designed for him individually, and needs to have further education on the importance of foot care with diabetic peripheral neuropathy.

Looking at the risk factors for nonadherence are pivotal in the future treatment of R. J.. In a study examining the rate of nonadherence among a rural community, many risk factors were found. 328 participants from thirty four villages were asked if they were adherent, in a quantitative fashion, and the health care workers were asked as a follow up to find reasons why these people may be non adherent to their diabetes medication. The study found numerous reasons, but the more common reasons included a lack of knowledge, availability, and a weaker structure of primary care (Venkatesan, Dongre & Ganapathy, 2018). R. J. mentioned he stopped taking his insulin due to the cost and insurance only paying for a small portion of the total cost.

He also appeared to have a decreased level of diabetes knowledge, so it is important to assess his current level, and focus on the barriers to his care instead of prescribing a medication he has no way of affording.

Interventions

Impaired Tissue Perfusion

Impaired tissue perfusion must be resolved by increasing blood flow back to R. J.'s right foot, and by doing so, the healing process can begin. During the shift, R. J. was unable to have anything by mouth (NPO) due to the possibility of surgery, which he had in the early evening. This was a collaborative effort in order to clean the wound and ensure the blood vessels were still viable. Collaboration was also used in the medication orders for R. J.. He had amlodipine ordered at five milligrams daily in order to maintain his blood pressure, which decreased the work on the heart and also meant he would not be causing strain to his vasculature.

Due to being NPO, his blood glucose levels were able to decrease slowly, and insulin was ordered for once he began to eat again. This is another collaborative intervention with the physician and pharmacy. His glucose levels needed to decrease in order to properly care for him and to treat the underlying illness.

Since he needed surgery, anticoagulation therapy was not started, but after, it is recommended he would be started on an anticoagulation medication such as heparin or Lovenox. This is a common prophylactic intervention done at Bon Secours hospitals and in many others. It is in order to prevent blood clots known as deep vein thrombi. A thrombus could also cause the occlusion of the blood vessel in the leg, and lead to more ineffective tissue perfusion.

Mobility and exercise are also helpful interventions improving the tissue perfusion. The mobility helps with venous return when the muscles are contracted. It also helps to begin the process of increasing mobility in a patient's daily life in order to combat diabetes.

Non-Adherence

R. J.'s non-adherence had many reasons behind it. He stated the insulin became too expensive and his insurance did not cover enough of the cost, he had a lack of nutritional education, and did not understand the proper care of his feet and when to seek a medical professional.

In order to understand and help R. J., it is important to assess his barriers to care. He was unable to pay for his insulin, so it is important to discuss with case management to get them working with him to either find ways for him to afford the medication or finding a new health insurance that works better for him. This ties in with the study previously discussed which looked at the barriers to care, and although it focused on rural areas, R. J. is still unable to have the proper primary care he needs (Venkatesan, Dongre & Ganapathy, 2018). He needs to have a primary care physician that is more accessible to him, and one that is able to work with his schedule.

His diet also must be looked at, and he needs further education on the diabetic diet. He stated he often drinks at least a quart of chocolate milk daily, and many of the foods he listed as his favorite were foods high in sugar. He claimed it was all due to a sweet tooth, but his culture should also be assessed. Given his lower socioeconomic status, it is more likely he would have foods higher in salts and sugars, which can raise his glucose and blood pressure levels. He needed more formal education, but before it could begin, his health literacy needed to be

assessed. From an informal assessment, his literacy seemed to have some flaws in logic. He seemed proud of how much sugar he ate until he saw the nurse's face, and began to understand his dietary habits are dangerous.

His teaching needs are numerous, but it is also important to include his support system in order to have stricter adherence to the education materials. His support system included his wife and adult children, but all of them had full time jobs, so the education would be better in the evening when the family is available. In this way, his education must be centered around him and his needs. His family should be included in education pertaining to his diet and proper foot care.

R. J. waited six months from the beginning of the "callus" forming to seeking medical attention in regard to his foot. Due to the neuropathy, he may not have realized the toe's state of health, or felt it was stable. The pictures he showed had a drastic change over the past week, but he still should have received medical treatment sooner, and he may not have needed the surgery if he had. Turns provides an article designed for patients to understand how to care for their feet, and what they can do to intervene (2015). The likely reason for R. J.'s injury was either improper shoe attire or repeated pressure from a tool at work. Once he began to speak about his job, it became clear where the injury most likely originated from. The article continues to suggest looking at his feet daily and making sure they are clean and intact. With this knowledge, R. J. would be able to take proper care of his foot. He has also seen the consequences of improper care, so he is more likely to adhere to his diabetes management than before this hospitalization.

Evaluation

The plan for adherence is well thought out, and it is important to continue to encourage him to take control of his care. At the end of shift, he was very hungry and not ready to learn. He

also did not have his support system with him at the time, so in the evening after he has had dinner and family with him, he will be more receptive to the teachings. The night nurse can also include his wife in the education materials, especially with the diet and foot care. The biggest barrier to his care will also likely be the hardest to solve. He needs more coverage of his health insurance for his insulin, but has limited resources to find a new health insurance company. R. J. will continue to learn, and after this hospitalization, he is more likely to take control of his care and understand the consequences of his actions.

The impaired tissue perfusion will take longer to evaluate. He will likely need to stay on the unit until they begin to see signs of healing and improved blood flow. He has been able to keep his foot during this stay, but it is important he understand the damage consistently high glucose levels can have on the body. He should also be encouraged to increase his mobility, which helps with blood flow and blood return.

Conclusion

The damage diabetes can do to the body is terrible, but so often overlooked by the patient. Non-adherence to medication, lifestyle choices, and self care has created the health problem of a necrotic and gangrenous toe in R. J.. Upon meeting him to the end of shift, he was well mannered, but had the beginnings of informal teachings, and will need to continue the educational interventions. He must adhere to the lifestyle changes laid out so he can provide care for himself and in order to manage his condition better.

This case has helped to prove the importance of community health continued to show a patient is still a part of a larger community, so it is pivotal to include the thoughts of the community and culture they are coming from. Although it is important to take responsibility, the

current healthcare system continues to endanger many of citizens. It is astounding the damage that can be caused by a lack of resources and availability of a medication. Before blaming the patient, as was seen in some nurses' mannerisms, it is important to try to understand the patient and the culture that may have brought them in today.

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