
Abstract

Background and Overview: An 80-year old female with a history of surgery, cardiovascular disease, metabolic disease, urinary tract infection, and multiple medications, including levofloxacin reported to the urgent care department with signs and symptoms of delirium.

Case Description: The patient was unaware of why she was present at the urgent care department and referred to the staff as “devils and witches” and uttered obscenities at the staff. Attempts to get the patient to be cooperative were futile and the patient eventually left the urgent care against the advice of the staff. The patient returned some weeks later, alert, and responsive and with no memory of her prior attendance at the clinic. He granddaughter reported that prior to coming to the clinic; the patient was hospitalized with urinary tract infection and treated with levofloxacin.

Results: The required extractions were done on the patient at the last appointment, with no problem.

Conclusions and Practical Implications: Delirium should be considered as a possible explanation for patients who are acting strangely and using obscenities in a dental setting. Particularly if such patients have metabolic or cardiovascular disease, history of surgery, infections, or receiving antibiotic treatment. If central nervous system toxicity to the antibiotic is suspected, then cessation of the medication should restore the patient to neurologic equilibrium.

Keywords: Antibiotics; Drug interaction; Cardiovascular disease; Anxiety disorder

Abbreviations: CDC: Center for Disease Control; HIPAA: Health Insurance Portability and Accountability Act; GABA: Gamma-Amino Butyric Acid

Introduction

The United States is experiencing a tremendous growth in its geriatric populations of individuals aged 65 years and older. This rapid growth is largely due in part to two independent factors; first, the baby boomers coming of age, with the leading edge of the boomers turned 65 in 2011. Second, individuals are living longer as a consequence of the advances in modern medicine. The Center for Disease Control (CDC) predicts that by 2050, it is anticipated that Americans aged 65 or older will number nearly 89 million people [1]. More than a quarter of all Americans and two of three older Americans have multiple chronic conditions, and treatment for this population consumes nearly 66% of the country’s health care budget. Individuals with chronic diseases are prone to have other health challenges including mental illness, dementia or other cognitive impairments [2]. These multiple maladies necessitate treatment by multiple health care specialists, a variety of treatment regimens, and prescription medications that may not be compatible. Thus individuals with multiple chronic conditions are at an increased risk of conflicting medical advice, unnecessary and duplicative tests and adverse drug reactions. One adverse drug reaction that is accompanied by devastating risks, yet poorly understood is delirium. Contrasting symptoms of dementia and delirium are listed in (Table 1). Traditionally the distinction between delirium and dementia has been made on the basis of acuteness of action and temporal course [3]. Koponen and colleagues [4] points out that delirium may be a harbinger of an underlying, undiagnosed dementia or cognitive defects that persists may be related to medical problems, direct neurotoxicity of delirium or to the effects of medication. One such medication is levofloxacin, a third-generation fluoroquinolone. We report the case of an 80-year-old female who presented to the urgent care clinic with levofloxacin therapy-psychosis.

Table 1: Contrasting Symptoms of Delirium and Dementia.

<table>
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<tr>
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<th>Mental State</th>
<th>Symptoms</th>
<th>Onset</th>
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<tbody>
<tr>
<td>Delirium</td>
<td>Varying degree of confusion</td>
<td>Disorientation, hallucinations, agitation, apathy, withdrawal, impairment in memory and attention Altered level of consciousness Disorganized thinking</td>
<td>Sudden onset; most cases remit with correction of underlying medical condition</td>
</tr>
<tr>
<td>Dementia</td>
<td>Memory impairment</td>
<td>Disorientation, agitation</td>
<td>Chronic slow onset</td>
</tr>
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Case Report

An 80 year old black female patient reported to the University of Texas, School of Dentistry’s Urgent Care Clinic on several occasions. She was referred by her physician for dental evaluation of several painful teeth. She stated that her last comprehensive dental care was done at least 10 years ago. Her medical history was significant for a diabetic coma, stroke and heart attack 3 years ago, resulting in her being hospitalized for 6 weeks. She also stated that she had a seizure, associated with malignant hypertension 3 years ago, for which she was also hospitalized for 4 weeks. She also reported a fractured orbital bone resulting from a fall, for which she was treated on an outpatient basis. Treatment with Lisinopril (10mg) resulted in an episode of angioedema for which she was hospitalized for 1 week, almost 18 months ago. The patient was managed for her type II diabetes with HumalogKwikPen (Insulin Lispro) 100 units/ml, and Lanatus (SoloStar) 100 units prior to bed. Several drugs were used to manage her hypertension, including Hydralazine (25mg TID), Losartan (100mg), Atenolol (50mg TID) and Hydrochlorothiazide (25mg). Other medications taken by the patient include, Atorvastatin (40mg for hypercholesterolemia), Phenytoin (50mg BID; for seizures), Levotheroid (Levothyroxine sodium 50 mcg for hypothyroidism), Xanax (prn for anxiety) and aspirin as a preventative. Her vital signs over six visits were generally within normal limits. Radiographs indicated moderate periodontal disease, several non-restorable teeth (#3 and 8) and carious lesions were noted on teeth #9, 11, 28, 29. Her dental history included an upper and lower partial for replacement of several painful teeth. She stated that her last comprehensive dental care was done at least 10 years ago. Her medical history included an upper and lower partial for replacement of several painful teeth. She stated that her last comprehensive dental care was done at least 10 years ago. Her medical history was significant for a diabetic coma, stroke and heart attack 3 years ago, resulting in her being hospitalized for 6 weeks. She also stated that she had a seizure, associated with malignant hypertension 3 years ago, for which she was also hospitalized for 4 weeks. She also reported a fractured orbital bone resulting from a fall, for which she was treated on an outpatient basis. Treatment with Lisinopril (10mg) resulted in an episode of angioedema for which she was hospitalized for 1 week, almost 18 months ago. The patient was managed for her type II diabetes with HumalogKwikPen (Insulin Lispro) 100 units/ml, and Lanatus (SoloStar) 100 units prior to bed. Several drugs were used to manage her hypertension, including Hydralazine (25mg TID), Losartan (100mg), Atenolol (50mg TID) and Hydrochlorothiazide (25mg). Other medications taken by the patient include, Atorvastatin (40mg for hypercholesterolemia), Phenytoin (50mg BID; for seizures), Levotheroid (Levothyroxine sodium 50 mcg for hypothyroidism), Xanax (prn for anxiety) and aspirin as a preventative. Her vital signs over six visits were generally within normal limits. Radiographs indicated moderate periodontal disease, several non-restorable teeth (#3 and 8) and carious lesions were noted on teeth #9, 11, 28, 29. Her dental history included an upper and lower partial for replacement of teeth: #s 1,2,14,15,1,17,1,29,30,31,32. She reported the teeth were extracted over the years with the last lower molar approximately 20 years ago.

Questionable actions

The visit in question (#6 over several months) started with the patient arriving 4 hours early for her appointment. She appeared uncharacteristically disheveled and seemed to be unclear as to why she was at the office. She began the appointment with shouts and obscenities. She called the staff “devils and witches.” Office protocols dictated activation of the emergency procedures. Our response team: evaluation of her vitals which included: blood pressure, 132/78/94, respiration was 21/minute, temperature 100.2. Several attempts were made to evaluate her blood glucose and apply oxygen; however she became extremely agitated and left the clinic against our professional recommendation without further incident. Subsequent attempts to contact the patient failed. Six weeks after the appointment in question, the patient returned to the urgent care clinic with her granddaughter. She had no memory of her last visit and requested that we complete her evaluation. She appeared ready to complete an emergency dental evaluation. She stated that prior to her previous appearance at the clinic, her grandmother had been hospitalized for 3 weeks due to a urinary tract infection, for which she received treatment with LV. Levaquin (levofloxacin) for 2 days. The patient had several severe episodes of delirium which included hallucination. Her primary care physician’s advised that she had been treated with 50 mg of Xanax TID P.R.N. for management of anxiety, if symptoms presented. The patient resumed her normal appearance, was engaging, inquisitive, and presented with no memory of her last visit. Her vitals were within normal limits and the last 2 extractions were completed without incidence. HIPAA, the federal Health Insurance Portability and Accountability Act of 1996, defines protected health information “minimum necessary information” in a separate paragraph if needed or I can just provide the code citations for those terms as defined in the HIPAA law. When treating a patient who is not consentable due to a medical condition or medication causing altered mental status or delirium and you need to ensure this person seeks appropriate medical treatment, the following question arises: Can a dentist, without violating HIPAA Privacy laws, disclose protected health information regarding the patient’s current medical condition and mental incapacity to a patient’s family member or friend in order to facilitate the patient seeking the proper medical treatment? The answer is yes; when your patient is suffering from an altered mental status or delirium, effectively rendering the patient incapacitated and unable to consent to the disclosure of Private Health Information, PHI, the HIPAA privacy rules permit limited disclosure of PHI. This issue is addressed in HIPAA section 164.510(b) (3) titled Limited uses and disclosures when the individual is not present. This section states, “If the individual is not present, or the opportunity to agree or object to the use or disclosure cannot practically be provided because of the individual’s incapacity or an emergency circumstance, the covered entity (defined to include health care providers) may, in the exercise of professional judgment, determine whether the disclosure is in the best interests of the individual and, if so, disclose only the protected health information that is directly relevant to the person’s involvement with the individual’s health care.” Pursuant the “minimum necessary” information provisions of HIPAA, the information disclosed to the family member should be limited to only that information necessary to address the patient’s condition which has rendered them not consensable.

Discussion

This case report illustrates the association between delirium, medical conditions and medications used to treat such conditions. According to Inouye et al. [5,6], the geriatric population faces a greater risk of psychiatric challenges due to factors such as pharmacotherapy, infections, cardiovascular diseases, metabolic conditions, trauma and surgery. All these factors are manifested in our patient of interest. Of particular interest to dental professionals are the neurotoxin adverse reactions of antimicrobials. These reactions tend to be unexpected and unpredictable, however an awareness of the antimicrobials agents that are associated with neurotoxin adverse effects may be helpful in diagnosis by the physician and management by both physician and dentist, when there is an occurrence of such incidents. Symptoms of CNS toxicity could be mistaken for a worsening progression of an infection, in which case the practitioner may be tempted to continue the use of antimicrobial agent, resulting in possible harm to the patient. The physiological changes in the pharmacokinetic properties of drug absorption, protein binding, distribution, metabolism and elimination predispose the elderly to adverse drug reaction. Fluoroquinolone such as levofloxacin are commonly used to treat urinary tract infections in medicine [7] and in dentistry, agents such as ciprofloxacin may be used as adjunct in the treatment of aggressive periodontitis due to Enterobacteriaceae. Neurotoxicity occurs in 1%-2% of patients taking fluoroquinolones [8] and is reported as headache, insomnia, dizziness, and hallucinations. The structural similarity between quinoline and gamma-amino butyric acid (GABA), the major inhibitory neurotransmitter in the brain, may account for the majority of neurologic adverse effects. Quinoline can displace GABA from its receptor binding site, thereby acting as GABA antagonists. Fluoroquinolone also appear

References

