Erythromycin-Induced Psychotic Decompensation in a Patient Affected by Paranoid Schizophrenic Psychosis

Branislav Ostoja Šakić¹, Sinisa Svetozar Babović¹, Zoran Milan Gajić¹

INTRODUCTION

Erythromycin is a macrolide bacteriostatic antibiotic often used in Serbia, especially in the treatment of respiratory infections. This antibiotic is metabolized through the liver and inhibits cytochrome enzyme P450A (CYP) 3A4¹. It is also given to patients allergic to beta-lactam antibiotics. Like all medicines, erythromycin can have numerous side effects, the most common ones being nausea, diarrhea, abdominal pain, vomiting, increased liver enzymes, and jaundice. Less common side effects are epidermolyis, hearing problems, dizziness, pancreatitis, and CNS side effects (hallucinations, psychotic reactions, insomnia, nightmares), which occur in less than 0.1% of patients²-⁵. Special caution is necessary if this group of antibiotics is given to individuals who already have a diagnosed mental illness, neurological disease, or previous CNS injuries and infections.

CASE DESCRIPTION

The patient was a 64-year-old man with a long-standing mental illness, having suffered from paranoid schizophrenic psychosis with residual symptoms (F20.5 according to ICD 10) since the...
age of 38. For the previous eight months he had been in remission with a PANSS total score of 70 at the last check-up three months before the reported episode; he was compliant and was receiving regular pharmacotherapy (chlorpromazine 25 mg 1+1+2, lorazepam 2.5 mg 1+0+1 and fluphenazine decanoate 25mg every 30 days i.m.). In January 2013, symptoms such as coughing, difficulties in breathing, weakness, weariness, and subfebrility prompted the patient to contact the physician on duty for a check-up. After the examination and diagnosis (general practitioner examination, pulse oximetry, standard laboratory tests, X-ray findings), acute bronchitis was ascertained. The doctor introduced erythromycin into therapy (1g/day). However, on the third day of the treatment with erythromycin, the patient experienced gross acute changes in the manifestation of acute psychotic clinical symptoms, i.e. aggravation of the existing chronic schizophrenic psychosis. The clinical picture was at that time dominated by hallucinatory acoustic activity, pseudo-religious and megalomaniacal delusional ideas of extracorporeal management, and bizarre, unsystematic intense psychomotor agitation; his PANSS total score was 137. Erythromycin was then abruptly discontinued, and due to the existing inflammatory process in the lungs, amoxicillin (1.5 g/day) and metronidazole (1.2 g/day) were introduced. The acute psychotic clinical symptoms gradually disappeared within 48 hours upon discontinuation of erythromycin without adjusting the psychopharmacotherapy (seven days after discontinuation of the antibiotic, his PANSS total score was 81). We did not decide to intensify the antipsychotic treatment because the occurrence of the psychotic reaction was correlated with the introduction of erythromycin into the therapy. The patient had been permanently hospitalized in a social institution specializing in the care of chronic psychiatric patients, thus monitoring of the clinical picture related to the introduction and discontinuation of the antibiotic was performed adequately.

**DISCUSSION**

This case shows that erythromycin applied in the treatment of respiratory infections in this patient caused CNS side effects. From the medical history dating back to May 1999, it became evident that the same patient had been given erythromycin 1.5 g per day for a period of seven days due to a purulent skin infection (carbunculus). During that period, while the patient was using erythromycin, he exhibited anxieties, fears, psychomotor acceleration, insomnia, and inconsistent speech disorder. At the time, the symptoms were not related to erythromycin, although after the erythromycin therapy was ended, the symptoms receded. At that time, the worsening of the patient’s clinical presentation had been treated with larger doses of antipsychotic chlorpromazine (from 75 mg to 125 mg).

In the literature, different forms of clinical symptoms have been described as consequences of the effect of macrolide antibiotics on the CNS (mania, psychotic reaction, delirium, nightmares, psychomotor agitation)\(^6-11\). In 1981, Cohen and Weitz first described two cases of psychiatric complications in patients who received erythromycin\(^12\). The exact mechanism of the described side effects is not known. There are numerous assumptions and explanations that the active metabolite of erythromycin passes through the blood-brain barrier and causes imbalance between GABA-ergic and glutamatergic activities in favor of the latter\(^13\). The literature also mentions the possible antagonization of GABA A receptors, protein and pyridoxine synthesis inhibition\(^14\), and an increase in endogenous glucocorticoids in the CNS\(^15\). Thus, in the face of various assumptions, the mechanism remains unknown. We must bear in mind that erythromycin is one of the important inhibitors of cytochromal enzymes in the liver, possibly also affecting the pharmacokinetics of other drugs in the body.

The aim of this presentation was to show that in patients with a diagnosed mental illness, the use of drugs unrelated to the management of their
primary condition, in this case antibiotics, can cause side effects similar to the symptoms of a deterioration of their mental illness; this is not to say that erythromycin should not be used in patients with a mental illness, but it is necessary to consider the possible side effects. Therefore, psychiatrists and other doctors need to be familiar with side effects and drug interactions.

References:


