

Acute Psychotic Attack under Isoniazid Treatment: a Case Report

Gokhan Umut¹, Bahar Dernek²,
Ilker Kucukparlak³, Tugba Aydin²,
Nesrin Karamustafalioglu⁴,
Fatma Nur Kesiktas⁵

¹Bakirkoy Training and Research Hospital for Psychiatry,
Neurology and Neurosurgery, Alcohol and Substance
Research, Treatment, and Training Center (AMATEM),
Istanbul - Turkey

²Istanbul Physical Therapy and Rehabilitation Training and
Research Hospital, Istanbul - Turkey

³Self-employed physician, Istanbul - Turkey

⁴Bakirkoy Training and Research Hospital for Psychiatry,
Neurology and Neurosurgery, Psychiatry Clinic,
Istanbul - Turkey

⁵Istanbul Physical Therapy and Rehabilitation Training and
Research Hospital, Istanbul - Turkey

ABSTRACT

Acute psychotic attack under isoniazid treatment: a case report

Isoniazid (isonicotinic acid hydrazide [INH]) has been used for treatment of tuberculosis since 1952. Pyridoxal-5-phosphate and consequently GABA synthesis are decreased by INH, which increases cerebral excitability, and thus seizures might occur this way. In some rare cases, INH may induce mania, depression, obsessive-compulsive disorder, and psychosis via acting as a monoamine oxidase (MAO) inhibitor or by decreasing pyridoxine. In this report, a 28-year-old man with acute psychotic attack under prophylactic INH treatment before infliximab treatment, was presented.

Keywords: Isoniazid, psychotic disorders

ÖZET

İsoniazid tedavisi altında tetiklenen akut psikotik atak: Olgu sunumu

İsoniazid (izonikotinik asit hidrazid [INH]), 1952 yılından bu yana tüberküloz tedavisinde kullanılan bir ilaçtır. INH aşırı dozda piridoksal-5-fosfat ve GABA sentezini azaltarak serebral uyarılabilirliği artırır ve böylece epileptik nöbetlere neden olabilir. Bazı nadir olgularda, izoniazidin bir monoamin oksidaz (MAO) inhibitör etkinliği ya da piridoksin azalması yoluyla mani, depresyon, obsesif kompulsif bozukluk ve psikoza neden olduğu düşünülmektedir. Bu yazıda infliximab tedavisi öncesi profilaktik olarak başlanan INH tedavisi altındayken akut psikotik atak geçiren 28 yaşında erkek olgu sunulmuştur.

Anahtar kelimeler: Isoniazid, psikotik bozukluklar



Address reprint requests to / Yazışma adresi:
Bahar Dernek,
Istanbul Physical Therapy and Rehabilitation
Training and Research Hospital,
Istanbul, Turkey

Phone / Telefon: +90-212-496-5000

Email address / Elektronik posta adresi:
bahardernek@gmail.com

Date of receipt / Geliş tarihi:
September 14, 2015 / 14 Eylül 2015

Date of the first revision letter /
İlk düzeltme öneri tarihi:
October 28, 2015 / 28 Ekim 2015

Date of acceptance / Kabul tarihi:
February 3, 2016 / 3 Şubat 2016

INTRODUCTION

Annually, an average of 9 million new Mycobacterium tuberculosis infection cases is being diagnosed in the world every year (1). World Health Organization (WHO) recommends most commonly isoniazid (isonicotinic acid hydroxylase, INH) in treatment and prophylaxis of this infection (1). INH inhibits production of mycolic acid which is essential for the cell wall by inhibiting fatty acid synthase II enzyme, and cell division. Side effects such as irritability, sleeplessness, muscle twitches, sensorial neuropathy,

hepatic and/or bone marrow suppression, systemic lupus erythematosus, and acute psychotic attack have been defined for INH (2). INH induced psychotic diseases are rarely encountered, and the most common ones are psychosis, obsessive-compulsive disease, and mania (3). The exact mechanism of INH induced psychosis is unknown, but it has been suggested that as INH interacts with various metabolites which are necessary for normal functions of neurons, it may lead to psychosis depending problems caused by these mechanisms (4). In this case presentation, a 28 years old male patient who developed acute psychotic attack under INH treatment is reported.

CASE

A 28 years old single male patient applied to psychiatry emergency outpatient clinic with psychotic complaints accompanying by his parents. In his personal history, he was followed up with the diagnosis of ankylosing spondylitis for 9 months before he applied to the psychiatry emergency at rheumatology outpatient clinic of department of physical therapy and rehabilitation at Medical Faculty of Istanbul University. He started treatment with salicylazosulfapyridine 1000mg/day and diclofenac 100mg/day, but his complaints were not improved markedly. Therefore, considering that he satisfied the indication criteria, it was decided to initiate a tumor necrosis factor alpha (TNF α) blocker, infliximab 100mg concentrated intravenous (IV) infusion, which increased active tuberculosis infection after obtaining the informed consent of the patient. The safety monitorization form was filled up for the patient, and he was consulted for tuberculosis prophylaxis with department of chest diseases at Medical Faculty of Istanbul University. The PPD result was reported as >5mm, so INH prophylaxis was decided to start at 300mg/day dose. Approximately after 10 days of INH 300mg/day treatment, his psychiatric complaints started acutely, and especially sexual thematic paranoid delusions were prominent (i.e. his friends were homosexual, and they would have sexual intercourses with him and record them by using a hidden camera etc.). He thought that his father and sibling would harm him. Consequently, his grandiose delusions started (i.e. secret services were following him because they wanted to work with him etc.). According to anamnesis taken from the patient, delusions of mind reading, mystic grandiose delusions (i.e. he would decide who would go to the hell or heaven) were observed. He complained to his manager that there were bugs on people who worked at the same company. Due to described symptoms and signs, the patient was brought to the psychiatric emergency service by his parents. No pathology was detected in his cranial computerized tomography and diffuse magnetic resonance examinations requested in

consultation with department of neurology. He was hospitalized in the psychiatry clinic.

In the psychiatry examination, he did not have insight, and he had severe grandiose, reference, and persecution delusions. The patient had no perceptive problem, and his abstract thinking, test judgement, and behavioral planning were all sufficient. Treatment was started with oral quetiapine 300mg/day, haloperidol 20mg/day and biperiden 10mg/day intramuscularly, and INH was discontinued. On Day 2 of hospitalization, especially persecution type delusions were more marked. As marked agitation was added up the clinical picture, he was consulted with the departments of physical treatment and rehabilitation, chest diseases, and internal medicine, and a decision of electroconvulsive therapy (ECT) with anesthesia was made. The patient received 9 ECT sessions within 20 days. After the first week, his persecution delusions were improved, but grandiose delusions and elation picture became prominent characteristics of the clinical picture. The patient told that sportive activities were good for him. His affect was euphoric, and psychomotor activity was increased. After the second week of his hospitalization, his delusion were completely recovered, and he gained a complete insight for his condition. The patient was discharged on Day 28 of his hospitalization with quetiapine 300mg/day, haloperidol 20mg/day, biperiden 4mg/day oral treatment. As he developed akathisia due to haloperidol in outpatient clinic follow-ups, the treatment was readjusted as oral olanzapine 20mg/day. During his control visits, no psychotic sign was diagnosed, so olanzapine was continued as 5mg/day at the second month of discharge.

DISCUSSION

Psychiatric symptoms and signs related to INH treatment have been defined since 1950s (5). However, information about this issue is still limited, and it is reported generally as case reports (4,6,7). Additionally, Jackson defined in 1957 five psychiatric cases related to INH treatment, in two of which paranoid delusion

were prominent (5). In a review, it was mentioned that there was no special pattern for INH related psychosis, and confusion, mania, hallucination and paranoid delusions accompanied commonly (8). It was reported in the same review that no psychiatric complaint was present in 38 out of 110 cases with psychiatric disorders after INH use (8). Similar to cases and review in the literature, paranoid delusions were determined prominently in our case. It was determined that INH decreased number of N-methyl-D-aspartate (NMDA) receptors in the hippocampus, and this effect was abolished by addition of erdosteine which was an antioxidant molecule in a study performed to enlighten the relationship INH and psychiatric disorders, and with the hypothesis of INH might have toxic effects on oxidative stress (9).

Evaluating our case under the light of the literature, we believed that psychotic attack was due to INH treatment, because signs were improved after discontinuation of INH treatment, and initiation of ECT with antipsychotic treatment in the second week after hospitalization; no organic cause was determined; and patient did not require high doses antipsychotics during outpatient clinic controls.

INH is a commonly used agent in tuberculosis

treatment. Although it is known that it may have psychotic side effects since it has been available in the markets from 1950s, data about this issue are limited. As far as we know the present case is the first reported psychosis case due to INH treatment from our country. Although it is very rare to observe psychosis under INH treatment, it should be considered if an acute psychotic attack is developed under INH treatment. Therefore, it will be beneficial to inform patients and their relatives about with clinical pictures of paranoid and agitation and follow up patients closely.

| Contribution Categories | Name of Author |
|--------------------------------|--------------------------------------|
| Follow up of the case | G.U., B.D., I.K., T.A., N.K., F.N.K. |
| Literature review | G.U., B.D., I.K., T.A., N.K., F.N.K. |
| Manuscript writing | G.U., B.D., I.K., T.A., N.K., F.N.K. |
| Manuscript review and revision | G.U., B.D., I.K., T.A., N.K., F.N.K. |

Conflict of Interest: Authors declared no conflict of interest.

Financial Disclosure: Authors declared no financial support.

REFERENCES

- Herrag M, Sajjai H, Alaoui Yazidi A. Acute psychotic access following the administration of isoniazid. *Rev Pneumol Clin* 2011; 67:118-120. (French) [\[CrossRef\]](#)
- Ritter JM, Lewis LD, Mant TGK, Ferro A (editors). Selective Toxicity. In: *A Textbook of Clinical Pharmacology and Therapeutics*. Fifth ed. London: Hodder Arnold, 2008, 321-367.
- Alao AO, Yolles JC. Isoniazid-induced psychosis. *Ann Pharmacother* 1998; 32:889-891. [\[CrossRef\]](#)
- Prasad R, Garg R, Verma SK. Isoniazid and ethambutol-induced psychosis. *Ann Thorac Med* 2008; 3:149-151. [\[CrossRef\]](#)
- Jackson SL. Psychosis due to isoniazid. *Br Med J* 1957; 2:743-746. [\[CrossRef\]](#)
- Olsen PZ, Torning K. Isoniazid and loss of memory. *Scand J Respir Dis* 1968; 49:1-8.
- Friedman SA. Death following massive ingestion of isoniazid. *Am Rev Respir Dis* 1969; 100:859-862.
- Duncan H, Kerr D. Toxic psychosis due to isoniazid. *Br J Dis Chest* 1962; 56:131-138. [\[CrossRef\]](#)
- Cicek E, Sutcu R, Gokalp O, Yilmaz HR, Ozer MK, Uz E, Ozcelik N, Delibas N. The effects of isoniazid on hippocampal NMDA receptors: protective role of erdosteine. *Mol Cell Biochem* 2005; 277:131-135. [\[CrossRef\]](#)