

## First Report of a Disease by Rhazes 10 Centuries Ago

### Abstract

**Introduction:** Abu Bakr Mohammad Ibn Zakariya Al-Razi (865–925 CE), who was known as “Rhazes” in the west, was a famous scientist of medieval ages. He has more than 200 books and treatises. His masterpiece on medicine “*Kitab Al-Hawi Fi Al-Tibb*” contains around 900 case reports. Some of the diseases which seem to be recently reported have been stated previously, but not well described. Considering symptoms of the patient described at that time, differential diagnosis will be discussed. **Case presentation:** Rhazes described a patient with bilious fever. He had developed bloody urine and stool on the fourth day and fatigue. Subsequently, the patient’s urine and stool color turned into dark and black, respectively, and died the following day. According to Rhazes attitude, it was malignant measles. Meyerhof in his book has referred to post-measles acute glomerulonephritis, but more appropriate differential diagnoses are compatible with this patient. **Discussion:** One of the best diagnoses for this case can be Weil’s syndrome. Presence of fever, icterus, hemorrhage and renal injury, all suggest Weil’s syndrome without pulmonary involvement. The other probable diagnosis is thrombotic thrombocytopenic purpura (TTP). Meningococcal sepsis is the other possible diagnosis. **Conclusion:** To sum up, as three compatible diseases with the case; have been described more than a thousand years after Rhazes (Weil’s syndrome 1886, TTP 1925 and meningococemia 1805); if the case is either Weil’s or TTP or meningococcal sepsis, it is the first report of the disease in the world by Rhazes.

**Keywords:** Malignant measles, meningococemia, post-measles acute glomerulonephritis, Rhazes, thrombotic thrombocytopenic purpura, Weil’s disease

### Introduction

Persian medicine is one of the doctrines of medicine and its origin pretends to about 10,000 years ago. Persian medicine physicians not only assembled previous data but also added their own experiences to them.<sup>[1,2]</sup>

Abu Bakr Mohammad Ibn Zakariya Al-Razi (865–925 CE), known in west as “Rhazes,” was one of those Persian polymathes well-known for his immense contributions to the different fields of the science including but not limited to the chemistry, medicine, philosophy, astronomy, music and mathematics.<sup>[3,4]</sup>

He has written more than 200 books and treatises about variety of topics.<sup>[5]</sup> His masterpiece, “*Kitab Al-Hawi Fi Al-Tibb*” (a comprehensive textbook of medical practice and treatment) commonly known as *Liber continens* in Europe,<sup>[6]</sup> has been taught for centuries as a basic educational source at medical schools. It

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprints@medknow.com](mailto:reprints@medknow.com)

is an encyclopedia on practical medicine that was gathered by Rhazes and includes his precedent scholars’ opinions such as Hippocrates and Galen. In this book, approximately 900 case reports have been presented as an educational aid for the documentation of different diseases.<sup>[7]</sup>

Thirty-three of these case presentations have been gathered in the book: “*Al-Ghesaval-Hekayat-al-Marza*” (tales and stories of patients) by Meyerhof.<sup>[8]</sup> Some of the diseases which seem to be recently reported have been stated previously, but not well described.

The case which is presented in this article died from an acute illness; seemingly, an interesting case and perhaps the first to report this disease. Accordingly, the original excerpt from the original book is presented, followed by the signs and symptoms of the disease and probable diagnoses.

### Case Presentation

“A patient named Bani bin Sawada had a bilious fever. Bilious fever is a fever that

**How to cite this article:** Ghafouri RR, Araj-Khodaei M, Targi ST, Varshochi M, Parsian Z, Golzari SE. First report of a disease by Rhazes 10 centuries ago. *Int J Prev Med* 2019;10:6.

Rouzbeh R. Ghafouri, Mostafa Araj-khodaei<sup>1</sup>, Somaiyeh T. Targhi<sup>1</sup>, Mojtaba Varshochi<sup>2</sup>, Zahra Parsian, Reza Yarani<sup>3</sup>, Samad E. J. Golzari<sup>4</sup>

Emergency Medicine Research Team, Tabriz University of Medical Science, Tabriz, Iran, <sup>1</sup>Aging Research Institute, Tabriz University of Medical Science, Tabriz, Iran, <sup>2</sup>Department of Infectious Diseases, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran, <sup>3</sup>Department of Anesthesiology and Intensive Care Medicine, Tabriz University of Medical Sciences, Tabriz, Iran, <sup>4</sup>Department of Pediatrics E, Copenhagen Diabetes Research Center (CPH-DIRECT), Herlev University Hospital, Herlev, Denmark

### Address for correspondence:

Dr. Zahra Parsian, Department of Emergency Medicine, Tabriz University of Medical Sciences, Daneshgah Street, Tabriz - 51664, Iran. E-mail: [z.parsian@yahoo.com](mailto:z.parsian@yahoo.com)

### Access this article online

Website: [www.ijpvmjournal.net/www.ijpvm.ir](http://www.ijpvmjournal.net/www.ijpvm.ir)

DOI: 10.4103/ijpvm.IJPVM\_216\_17

### Quick Response Code:



ensues from bilious hummer excess. After 4 days, his urine became bloody and his stool changed to bloody green bile similar to blood of fresh meat; the patient suffered from fatigue. The patient's condition was steady until the night, but deteriorated and the disease recurred with the same severity. I suspected that he drank something. That day evening his urine and stool became black. On the sixth day, he died. He had malignant measles which had spread into his internal organs."

Rhazes described a patient with bilious fever (the patient had fever and icterus). He had developed bloody urine (i.e., hematuria) and stool (i.e., hematochezia) on the fourth day. He defined the appearance of the stool as fresh meat blood. The patient complained of fatigue which indicates generalized weakness.

According to what Rhazes has described, this disease was uncommon and unknown at the time and no new remarkable symptoms were observed until the fourth day. Subsequently, the patient's condition deteriorated and his urine and stool color turned into dark and black, respectively. Reference to dark urine might pertain to a subsequent acute glomerulonephritis or acute tubular necrosis<sup>[9]</sup> or probably gross hematuria. Also, black stool (melena) might have been a manifestation of gastrointestinal (GI) bleeding which ultimately changed to hematochezia on fifth day. The patient died in the morning of the sixth day.

From Rhazes' point of view, it was malignant measles which spread to the victim's internal organs. Since he has referred to measles, the patient must have had rashes which have not been mentioned directly in the case. To summarize, the patient had fever, icterus, fatigue, melena, hematuria and rashes with rapid progression to death.

Meyeroth remarked this collection of symptoms to be related to post-measles acute glomerulonephritis; nevertheless, considering the symptoms and presence of rectal bleeding, more appropriate differential diagnoses might be compatible with this patient. Fever, back pain, anxiety, insomnia, cough, headache and skin lesions are manifestations of measles according to ancient medicine.

## Discussion

There are some diagnoses for the reported case that can explain the patient's symptoms and acuteness of the disease which culminated in death. One of the best diagnoses for this case can be severe form of leptospirosis, Weil's syndrome. This syndrome is an infectious disease caused by leptospira. It is presented with a wide scope of symptoms and is a worldwide, sporadic and zoonosis disease.<sup>[10]</sup> It has abrupt onset with an incubation period of 2–20 days. Five-to-ten percent of patients show multi-organ failure, while others experience mild and subclinical form of the disease.<sup>[11]</sup> At all ages, symptoms include fever, myalgia and headache.<sup>[12]</sup> Other presentations are lethargy, emesis,

abdominal pain, photophobia, arthralgia, cough, diarrhea or constipation.<sup>[13]</sup>

Lung involvement can be seen in fatal Weil's syndrome, which is not mentioned in the case. Some articles have mentioned pulmonary involvement as the cause of death in 55% and other studies have shown that mortality rate reaches to 74% when lungs are affected.<sup>[14]</sup> Severe pulmonary hemorrhage syndrome is the major cause of death in Weil's syndrome in developing countries. Others are acute renal failure and also widespread hemorrhage.<sup>[15]</sup>

Another study that has been performed on 150 patients with Weil's syndrome concluded the following results: renal involvement in 100%, hemorrhagic syndrome in 50%, neurologic presentation in 48%, atypical pneumonia in 44% and GI involvement in 21%.<sup>[16]</sup>

Presence of fever, icterus, hemorrhage and acute renal injury in the patient, all suggest the conclusion that the patient had Weil's syndrome without pulmonary involvement. Although pulmonary involvement is a common cause of death in this syndrome, it can accrue without affecting lungs as well. Since Rhazes did not report any other similar cases, it seems as if the disease was of sporadic nature which is compatible with leptospirosis.<sup>[17]</sup>

The other probable diagnosis is thrombotic thrombocytopenic purpura (TTP). TTP is a multi-system disease which is diagnosed on the base of progressive appearance of the following symptoms: microangiopathic hemolytic anemia, thrombocytopenia, fever, neurologic and renal problems.

Prior to the effective treatment with plasma exchange, 90% of patients died from systemic microvascular thrombosis that caused cerebral and myocardial infarction and renal failure. Although GI bleeding and icterus are not encompassed in pentad of TTP, they can be found in the course of the disease. Rhazes patient, in addition to fever and renal involvement, suffered hemorrhage and icterus which can ensue from thrombocytopenia and hemolysis, respectively. Therefore, TTP could also be suggested for the patient. If Rhazes statement on measles is interpreted as purpura, it strengthens the diagnosis of TTP.<sup>[18]</sup>

Meningococcal sepsis is the other possible diagnosis of the patient. Meningococcal sepsis can cause hypotension, disseminated intravascular coagulation,<sup>[19]</sup> multiple-organ failure and osteonecrosis.<sup>[20]</sup> Rash – which is petechial, purpuric or maculopapular and arthritis are other signs of meningococcal disease.<sup>[21–23]</sup> The disease is fatal without appropriate treatment.<sup>[24]</sup> The patient's signs and symptoms can all be seen in meningococemia and icterus can be a result of end organ failure in the progression of the disease.

Another disease with hemorrhagic fever is dengue fever with mortality rate of 50% if untreated. It is transmitted through mosquito bite and causes bleeding from mucus

membranes, which is not prominent in this case; and the patient had icterus which is not a manifestation in dengue fever, all of which question the diagnosis of dengue fever.<sup>[25]</sup> The classical presentation of dengue fever is arthralgia, fever, headache and rash but our patient did not have either headache or arthralgia.<sup>[26]</sup>

## Conclusion

To sum up, three diseases are compatible with the case: Weil's syndrome, TTP and meningococemia. The first one has been described in 1886 by Weil in Germany, TTP in 1925 and meningococemia in 1805.

Since the reported case had a progressive course and high mortality rate and terminated in death in 6 days without receiving any treatment, according to the symptoms of patient, these diagnoses seem more probable. More accurate diagnoses could have been suggested if Rhazes had described more details about the patient such as: age, occupation, past medical history, appearance of probable skin lesion and presence of pulmonary and neurologic symptoms. If the case is either Weil's or TTP or meningococcal sepsis, it is the first report of the disease in the world by Rhazes.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

**Received:** 11 May 17 **Accepted:** 18 Jun 18

**Published:** 15 Jan 19

## References

1. Khodaei MA, Ghaffari F, Emadi F, Emaratkar E, Alijaniha F, Noorbala AA, *et al.* Healthy lifestyle in Prevention and Treatment of Depression from the View of Iranian Traditional Medicine. *Med Hist J* 2017;9:169-92.
2. Khodaei MA, Noorbala AA, Parsian Z, Targhi ST, Emadi F, Alijaniha F, *et al.* Avicenna (980-1032CE): The pioneer in treatment of depression. *Transylvanian Rev* 2017; 17: 4377-89.
3. Golzari SE, Khan ZH, Ghabili K, Hosseinzadeh H, Soleimanpour H, Azarfarn R, *et al.* Contributions of medieval Islamic physicians to the history of tracheostomy. *Anesth Analg* 2013;116:1123-32.
4. Nezhad GS, Dalfardi B. Rhazes (865–925AD), the icon of Persian cardiology. *Int J Cardiol* 2014;177:744-7.
5. Zargarani A, Azizi A, Kordafshari G, Borhani-Haghighi A. Rhazes Contribution to the Role of Nutrition in Preventive Medicine and Public Health. *Iranian J Public Health* 2014;43:1461-2.
6. Ashtiyani SC, Shamsi M, Cyrus A, Tabatabayei SM. Rhazes, a Genius Physician in the Diagnosis and Treatment of Nocturnal Enuresis in Medical History. *Iranian Red Crescent Med J* 2013;15:633.
7. Zarshenas MM, Mehdizadeh A, Zargarani A, Mohagheghzadeh A. Rhazes (865–925 AD). *J Neurol* 2012;259:1001-2.
8. Meyerhof M. Thirty-three clinical observations by Rhazes (circa 900 AD). *Isis* 1935;23:321-72.
9. Hall KS, Kusunoki Y, Gatny H, Barber J. Social Discrimination, Stress, and Risk of Unintended Pregnancy Among Young Women. *J Adolesc Health* 2015;56:330-7.
10. Bruce MG, Sanders EJ, Leake JA, Zaidel O, Bragg SL, Aye T, *et al.* Leptospirosis among patients presenting with dengue-like illness in Puerto Rico. *Acta Tropica* 2005;96:36-46.
11. Tilahun Z, Reta D, Simenew K. Global epidemiological overview of leptospirosis. *Int J Microbiol Res* 2013;4:9-15.
12. Katz AR, Ansdell VE, Effer PV, Middleton CR, Sasaki DM. Assessment of the clinical presentation and treatment of 353 cases of laboratory-confirmed leptospirosis in Hawaii, 1974–1998. *Clin Infect Dis* 2001;33:1834-41.
13. Organization WH. Human leptospirosis: Guidance for diagnosis, surveillance and control. 2003.
14. da Rocha Medeiros F, Spichler A, Athanazio DA. Leptospirosis-associated disturbances of blood vessels, lungs and hemostasis. *Acta Tropica* 2010;115:155-62.
15. Chakrabarti A, Nandy M, Pal D, Mallik S. A rare case of Weil's disease with alveolar haemorrhage. *Asian Pac J Trop Biomed* 2014;4:S66-9.
16. Fabri M. Clinical manifestations of leptospirosis. *Int J Infect Dis* 2010;14:e164.
17. Garcia MM, de Diego Damia A, Villanueva RM, Hontagas JL. Pulmonary involvement in leptospirosis. *Eur J Clin Microbiol Infect Dis* 2000;19:471-4.
18. George JN. Thrombotic thrombocytopenic purpura. *N Engl J Med* 2006;354:1927-35.
19. Blehar DJ, Dickman E, Gaspari R. Identification of congestive heart failure via respiratory variation of inferior vena cava diameter. *Am J Emerg Med* 2009;27:71-5.
20. Campbell WN, Joshi M, Sileo D. Osteonecrosis following meningococemia and disseminated intravascular coagulation in an adult: Case report and review. *Clin Infect Dis* 1997;24:452-5.
21. Stephens DS, Hajjeh RA, Baughman WS, Harvey RC, Wenger JD, Farley MM. Sporadic meningococcal disease in adults: Results of a 5-year population-based study. *Ann Intern Med* 1995;123:937-40.
22. Parmentier L, Garzoni C, Antille C, Kaiser L, Ninet B, Borradori L. Value of a novel *Neisseria meningitidis*-specific polymerase chain reaction assay in skin biopsy specimens as a diagnostic tool in chronic meningococemia. *Arch Dermatol* 2008;144:770-3.
23. Schaad UB. Arthritis in disease due to *Neisseria meningitidis*. *Rev Infect Dis* 1980;2:880-8.
24. Brandtzaeg P, van Deuren M. Classification and pathogenesis of meningococcal infections. *Neisseria meningitidis: Advanced Methods and Protocols*. 2012:21-35.
25. Gubler DJ. Dengue and dengue hemorrhagic fever. *Clin Microbiol Rev* 1998;11:480-96.
26. Dalugama C, Shelton J, Ekanayake M, Gawarammana IB. Dengue fever complicated with Guillain-Barré syndrome: A case report and review of the literature. *J Med Case Rep* 2018;12:137.