



# Journal of Medical Sciences

ISSN 1682-4474

**science**  
alert

**ANSI***net*  
an open access publisher  
<http://ansinet.com>

---

---

# Case Report

J. Med. Sci., 6 (4): 709-712  
July-August, 2006

*JMS (ISSN 1682-4474) is an International, peer-reviewed scientific journal that publishes original article in experimental & clinical medicine and related disciplines such as molecular biology, biochemistry, genetics, biophysics, bio-and medical technology. JMS is issued six times per year on paper and in electronic format.*

*For further information about this article or if you need reprints, please contact:*

Batool Sharifi-Mood  
Department of  
Infectious Diseases,  
Boo-Ali Hospital,  
Zahedan, Iran

Tel: 0098/541/3229811  
Fax: 0098/541/3229197

## **Mumps and Severe Neutropenia: Presentation of Two Cases and Review of the Literature**

<sup>1</sup>Batool Sharifi-Mood, <sup>1</sup>Malihe Metanat and <sup>2</sup>Manijeh Khalili

Mumps is a viral infection and most commonly refers to a systemic disease caused by the mumps virus, which is a paramyxovirus. Miscellaneous complication of the mumps have been reported. A mild leucopenia, rarely mild thrombocytopenia is the norm but to now, pancytopenia and severe neutropenia has not been reported. In this study, we reported two cases of mumps that had pancytopenia and were complicated with severe neutropenia. In addition, to look present of neutropenia in mumps, we decided to review the literature. In the both patients the outcome was infavourable and neutropenia was severe and led to sepsis and severe infections. In conclusion, these cases suggest that mumps infection should be included in the differential diagnosis of febrile neutropenia.

**Key words:** Mumps, leukopenia, neutropenia, pancytopenia

**ANSI***net*  
Asian Network for Scientific Information

<sup>1</sup>Department of Infectious Diseases, Boo-Ali Hospital, University of Medical Sciences, Zahedan, Iran

<sup>2</sup>Department of Pediatrics, Aliebn-E-Abitaleb Hospital, University of Medical Sciences, Zahedan, Iran

## INTRODUCTION

Mumps is an viral infection that caused by the mumps virus, which is a paramyxovirus. Classic mumps worldwide occurs in children younger than 15 years in 85% of cases (Robert, 2004). Mumps is endemic in certain heavily populated areas but occur in epidemics when many susceptible persons are crowded together. The incidence depends on the extent of vaccination in the region (Yvonne, 2003). Disease is spread by infected droplet or direct contact with materials contaminated by infected saliva. Although infection of the parotid glands is the most common manifestation in classic mumps, many other organs can be involved (Jane, 2004). Sometimes mumps infection only becomes apparent because of complications, without the telltale facial swelling. Miscellaneous complications have been reported. A well-known complication of mumps is inflammation of the testes. A fairly rare but potentially serious complication of the mumps is inflammation of the pancreas (Jane, 2004; Yvoone, 2003). Mumps virus can cause mild leukopenia but to our knowledge, severe leukopenia and neutropenia has not been previously reported. Herein, we report two cases of mumps who were complicated with pancytopenia and severe neutropenia and then severe infections.

### CASE 1

A 12-year-old girl was admitted to Boo-Ali Hospital (Zahedan, Southeast of Iran) for fever, headache and malaise in May 2004. She was well until six days before admission when, fever, headache, cough and coryza occurred. Two days later, the swelling of the both parotid glands occurred. On examination, she had a temperature of 39.6°C degrees, blood pressure of 110/75, heart rate of 90 and a respiratory rare of 20 per minute. She was ill-appearing. Respiratory, cardiovascular and neurologic examinations were normal. Her friend had a history of mumps in ten days ago and mumps was epidemic in her school. She was well neutriched and was full vaccinated without any surgical or significant past medical history and was on no medication except tablet adult cold and acetaminophen during four days ago. Laboratory values included a white blood cell count of 1150 cells mm<sup>-3</sup>, hemoglobin of 10.8 mg dL<sup>-1</sup>, platelets 147,000 and a normal chemistry panel. Liver function tests, fasting blood sugar and BUN, creatinine were normal. Chest-xray and sinus computed tomography scan were normal. On second day of admission, she was confuse and had a temperature of 40°C degree. Brain CT and

analyse of CSF was normal. At this time, laboratory values included a WBC count of 475 cells mm<sup>-3</sup>, hemoglobin of 10.5 mg dL<sup>-1</sup> and platelet 150/000. Routin culture of blood reveal a gram negative bacilli (Kelebcicella). Then patient was treated with ceftazidime 6 g, vancomycin 2 g, amikacin 600 mg intravenously daily. Twelve and 24 h later, White Blood Cell count (WBC) was 780 and 540 cells mm<sup>-3</sup>, respectively. She continued to have temperature of up 39°C for the first 72 h. Therefore, amphotericin-B was added to her drugs regimen. Bone marrow aspiration and biopsy did not show leukemia and other malignant disorders but there was a severe decrease in all cells, especially myeloid cells. Normal results were obtained in immunologic test including; neutrophil chemotaxis, NBT, serum immunoglobulin and complement levels. Serologic assays and PCR for HIV, HCV, HBV were negative but IgM-ELISA test for mumps was positive. On hospital day 9, she had no any apparently, clinical improvement and WBC count was 500 mm<sup>-1</sup>. Since, tuberculosis is endemic in this area, antituberculosis drugs was started and she was referred to ICU because of respiratory distress syndrome and hypotention. Unfortunately, her parent did not allow to other medication and she was discharged with very bad condition.

### CASE 2

A 15-year-old girl was referred to the Boo-Ali-Hospital in Zahedan on June 2004 because of fever, headache, cough, chest wall pain of 2 day ago and swelling of parotid gland of ten days ago. On Physical examination, she appeared ill and toxic with a temperature of 39.4°C. On examination, blood pressure of 110/65, heart rate of 85 and a respirator rare of 23 per minute with an oxygen saturation of 95% while breathing room air. Cardiovascular examinations were normal but there was a decreased pulmonary sound in right hemithorax. Platelet count was normal and hemoglobin concentration had decreased to 10.9 g dL<sup>-1</sup>. Leukocytes count was low (1100 mm<sup>-3</sup>). Routin culture of blood, urine and sputum were negative and IgM-ELISA for mumps was positive. Bone marrow aspiration and biopsy did not show any malignant disorders but there was a severe decrease in myeloid cells. Plain chest-x-ray and chest-ct scan showed multiple patchy infiltration in two lungs, she was fully vaccinated. The tuberculin skin test was negative. He had no a positive family history for tuberculosis and sputum smear was negative for mycobacterium tuberculosis and sputum culture was

negative. She was treated with vancomycin, ceftriaxone, cotrimoxazole and azithromycin but there was no a good response to treatment. On hospital day 4, WBC count was 400 and she referred to pediatric hospital for further evaluation. Then follow up of patient, showed that she had been treated for staphylococcal sepsis and then has been referred to immunologist. Using of subcutaneously administered Granulocyte Colony Stimulating Factor (GCSF) leded to dramatic increases in neutrophil counts, resulting in marked improvement of infection. During 5 weeks follow-up after discharge, there was a laboratory improvement in total white blood cells count (3950).

### DISCUSSION

Mumps is an viral infection usually contracted in childhood, which in up to one third may be asymptomatic or associated with only fever and malaise (Yvonne, 2003). A leukopenia is the norm in mumps. Thrombocytopenia is uncommon with mumps and only sporadic cases have been described (Jane, 2004). Pancytopenia and neutropenia have not been previously reported in mumps. We searched medline since 1960 but we did not find this complication. Neutropenia is a decrease in circulating neutrophils in the peripheral blood. The Absolute Neutrophil Count (ANC) defines neutropenia. ANC is found by multiplying the percentage of bands and neutrophils on a differential by the total white blood cell count. An abnormal ANC is fewer than 1500 cells per  $\text{mm}^3$ . The severity of neutropenia is categorized as mild with an ANC of 1000-1500 cells per  $\text{mm}^3$  moderate with an ANC of 500-1000 cells per  $\text{mm}^3$  and severe with an ANC of fewer than 500 cells per  $\text{mm}^3$  (Godwin, 2005). The risk of bacterial infection is related to the severity and duration of neutropenia. Morbidity usually involves infections during severe, prolonged episodes of neutropenia and mortality correlates with the duration and severity of neutropenia and the time elapsed until the first dose of antibiotics is administered for neutropenic fever (Freifeld, 1999). The etiology of neutropenia is different and can be classified as congenital or acquired and viruses are a important group among the acquired etiology but mump causes a mild leucopenia (Bodey and Buckley, 1996; Godwin, 2005). Sever neutropenia has not been reported. Only one case of severe neutropenia that led to acute necrotizing ulcerative gingivitis was reported during this epidemic of mumps in 2004 in Zahedan in Southeast of Iran (Sharifi-Mood and Mohraz, 2005). We think that the mumps virus that led to an epidemic in Zahedan was a different type and there was a necessity to further

evaluation. We reported this complication to Zahedan Center of disease control and prevention. Febrile neutropenia is a medical emergency and must be dealt with immediately (Anonymous, 1996; Finberg, 1999; Hughes, 1997). Any temperature over 100.5 F (Fahrenheit) or 37.5°C (Celsius) should be reported to the medical oncologist or hemayologist without delay. Hours and minutes are critical (Maher and Lieschke, 1994; Pizzo and Hathorn, 1986). Because, mortality correlates with the duration and severity of neutropenia and the time elapsed until the first dose of antibiotics is administered for neutropenic fever (Watts and Greer, 1999; Finberg and Talcott, 1999). In conclusion, these cases suggest that mumps infection should be included in the differential diagnosis of febrile neutropenia.

### ACKNOWLEDEGMENT

We thanks to all hospital staff in Boo-Ali Hospihal and also all reference laboratory staff who assisted us in diagnosis and treatment of patients.

### REFERENCES

- Anonymous, 1996. American Society of Clinical Oncology: Update of recommendations for the use of hematopoietic colony-stimulating factors: Evidence-based clinical practice guidelines. American Society of Clinical Oncology. *J. Clin. Oncol.*, 6: 1957-1960.
- Bodey, G.P., M. Buckley and Y.S. Sathe, 1996 Quantitative relationships between circulating leukocytes and infection in patients with acute leukemia. *Ann. Intl. Med.*, 2: 328-340.
- Finberg, R.W. and J.A. Talcott, 1999. Fever and neutropenia-how to use a new treatment strategy. *N. Eng. J. Med.*, 5: 362-363.
- Freifeld, A., D. Marchigiani and T. Walsh, 1999. A double-blind comparison of empirical oral and intravenous antibiotic therapy for low-risk febrile patients with neutropenia during cancer chemotherapy. *N. Eng. J.*, 5: 305-311.
- Godwin, J.E., F. McGaw and D. Shin, 2005. Neutropenia, Last up date, pp: 1-10.
- Hughes, W.T., D. Armstrong and G.P. Bodey, 1997. Guidelines for the use of antimicrobial agents in neutropenic patients with unexplained fever. Infectious Diseases Society of America. *Clin. Infect. Dis.*, 3: 551-573.

- Jane, Y., 2004. Mumps, Available at: <http://web.utc.ac.za/depts./mmi/jmoodie/mumps.html>.
- Maher, D.W., G.J. Lieschke and M. Green, 1994. Filgrastim in patients with chemotherapy-induced febrile neutropenia. A double-blind, placebo-controlled trial. *Ann. Intl. Med.*, 7: 492-501.
- Pizzo, P.A., J.W. Hathorn and J. Hiemenz, 1986. A randomized trial comparing ceftazidime alone with combination antibiotic therapy in cancer patients with fever and neutropenia. *N. Eng. J. Med.*, 9: 552-528.
- Robert, F., 2004. Mumps, last update, Oct., pp: 1-10.
- Sharifi-Mood, B., M. Mohraz, S.D. Mansouri and R. Alavi-Naini, 2005. Acute necrotizing ulcerative gingivitis; a rare complication of mumps, *JMS* (In Press).
- Watts, R.G., 1999. Neutropenia, In: Lee, G.R., J. Foerster, J. Lukens, F. Paraskevas, J.P. Greer and G.M. Rodgers (Eds.). *Wintrobe's Clinical Hematology*. 10th Edn., Baltimore, Md: Williams and Wilkins, 1: 1862-1888.
- Yvonne, M., M. Behrman and K. Jenson, 2003. In: *Nelson Text Book of Pediatrics* 16th Edn., Philadelphia, W.B Saunders Company, pp: 954-955.