

Varicella Pneumonia

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Abstract

A 50-year-old man, who contracted varicella along with his two sons, developed severe pulmonary complications afterwards and subsequently succumbed from respiratory failure. Diagnosis of varicella complicated with viral interstitial pneumonia was based on compatible clinical, virological and pathological evidence. (*J Infect Dis Antimicrob Agents* 1993; 10: 95-98)

Key words : *Varicella, Interstitial pneumonia*

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Varicella is one of the more readily communicable diseases of man. It is caused by the *Varicella-zoster* virus and is characterised by fever and a disseminated vesicular rash. The infection is common in children but uncommon in adults. While the disease is generally benign in otherwise healthy children, up to 50 per cent of infected adults may develop varicella pneumonia, a complication that causes significant morbidity and mortality (1,2). This communication describes a fatal case of varicella pneumonia which, to the best of the present authors' knowledge, is the first documented case in Thailand.

CASE REPORT

The patient, a 50-year-old man, was referred from a private hospital in Nonthaburi on June 17, 1992 for further investigation of possible varicella pneumonia (HN. 97163-35; AN. 1-24048-35).

Relevant history of the present illness dated back

to about a fortnight previously when the patient and his two sons developed chickenpox almost simultaneously (the younger son's eruptions started on June 5, the patient's on June 7, and the elder son's on June 12, 1992). Early in the morning of June 12, 1992 he was admitted to Nonthavej Hospital because of severe abdominal pain (HN. 25576-34; AN. 5501-35). On admission the patient was found afebrile; there were vesico-bullous lesions evenly distributed all over the body and only slight tenderness over the right subcostal region. An abdominal radiograph taken on the same day showed no remarkable abnormal findings, and the visible parts of both lower lung fields appeared absolutely clear. Routine laboratory tests revealed the following: haematocrit 47 per cent, haemoglobin concentration 14.9 g/dl, white blood cell count 6,100/mm³ with 78 per cent neutrophils and 22 per cent lymphocytes; platelets were adequate in number. Fasting blood sugar was 110 mg/dl, blood urea nitrogen 6 mg/dl, creatinine

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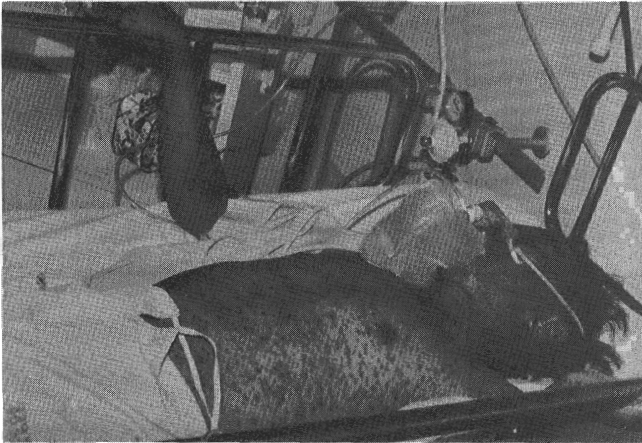


Fig. 1 A photograph of the patient showing heavily distributed skin lesions all over this body.

1.2 mg/dl, serum amylase 40 U/l, sodium 139 mEq/l, potassium 4.6 mEq/l, chloride 100 mEq/l, and CO_2 25 mEq/l.

At the beginning of hospitalisation, only palliative and supportive treatments were given for the patient's abdominal condition. On the second hospital day, however, body temperature began to rise and the eruptions progressed very rapidly and appeared densely packed all over the body, extremities, face and in the oral cavity (Fig. 1). On June 14, 1992, the patient became markedly dyspnoeic and a chest radiograph revealed diffusely distributed, fine reticulo-nodular infiltration in both lungs (Fig. 2). A provisional diagnosis of varicella pneumonia was then made and treatment with acyclovir (400 mg p.o. five times a day at first, later changed to 400 mg i.v. every eight hours) was instituted.

Follow-up laboratory findings were: white blood cell count $12,100/\text{mm}^3$ with 65 per cent neutrophils, 34 per cent lymphocytes and 1 per cent monocytes, and platelets $134,000/\text{mm}^3$; serum glutamic oxalacetic transaminase was 981 U/l (normal 0-40 U/l), serum glutamic pyruvic transaminase 814 U/l (normal 0-40 U/l), alkaline phosphatase 373 U/l (normal 70-300 U/l), total bilirubin 1.7 mg/dl and direct bilirubin 1.3 mg/dl; tests for anti-HZV, VDRL and anti-HIV antibody were all negative. Arterial gas analysis (FIO_2 80%) showed pH 7.452, PCO_2 31.3 mmHg, PO_2 45.0 mmHg, oxygen saturation 82.1 per cent, base excess -2.5 mmol/l, AaDO_2 495.3 mmHg, and a/A 0.08. Two specimens of haemoculture collected on June 15, 1992 grew *Staphylococcus* spp.

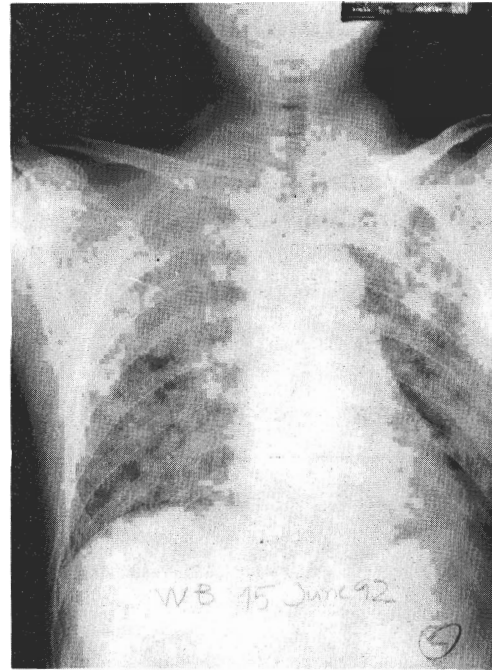


Fig. 2 A chest radiograph taken on June 15, 1992 showing fine reticulo-nodular infiltrates diffusely distributed in both lungs.

During the last two days of hospitalisation, the patient's condition became progressively worse, and just the night before referral to Siriraj Hospital, the patient lapsed into the state of cardio-respiratory arrest. Despite successful resuscitation, he went into deep coma followed by brain death.

During hospitalisation in Siriraj (June 17-21, 1992), treatment was mainly supportive along with relevant investigations. Complete blood counts showed the following: haemoglobin concentration 15.6 g/dl, haematocrit 45.7 per cent, white blood cells $14,800/\text{mm}^3$ with 96 per cent neutrophils, 3 per cent lymphocytes, 1 per cent monocytes, and an adequate number of platelets. Urinalysis data were: pH 7.5, SpGr 1.005, albumin 2+, sugar 1+, acetone negative, occult blood 3+, red blood cells 1-2/high-power field and white blood cells 3-5/high-power field. Blood chemistry data were: urea nitrogen 38 mg/dl (normal 7-20), creatinine 2.8 mg/dl (normal 0.5-1.5), uric acid 11.2 mg/dl (normal 2.4-7.0), cholesterol 109 mg/dl (normal 50-200), triglyceride 264 mg/dl (normal 50-200), lactic dehydrogenase 3,845 U/l (normal 230-460), GOT 1,030 U/l (normal 0-37), SGPT 625 U/l (normal 0-40), alkaline phosphatase 159 U/l (normal 39-117), total bilirubin 1.7 mg/dl (normal 0.3-1.2), direct biliru-

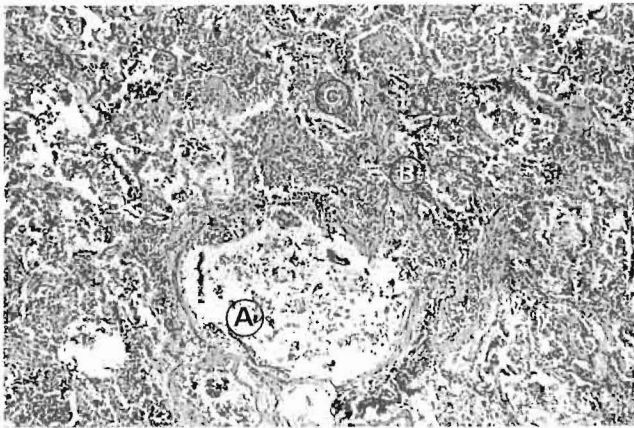


Fig. 3 Necrotizing bronchiolitis and desquamated epithelium (A) with interstitial pneumonia, focal hemorrhagic necrosis (B), and fibrinous exudate in the alveoli (C). (H&E × 40).

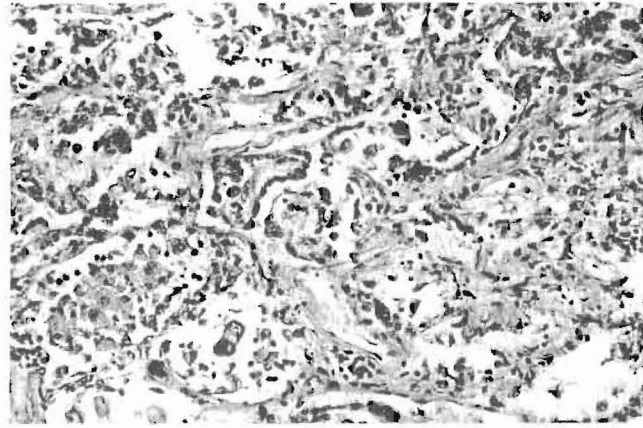


Fig. 5 Showing atypical hyperplasia of the alveolar lining cells, multinucleated giant cells and alveolar macrophages in the alveoli. Mononuclear cell infiltration in the edematous alveolar septa and in the alveoli were shown. (H&E × 100).

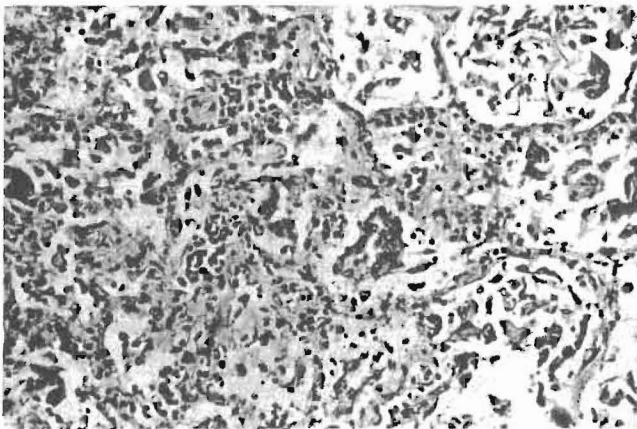


Fig. 4 Showing interstitial pneumonia, the alveolar septa infiltrated with mononuclear cells, desquamated epithelium, atypical multinucleated giant cells and alveolar macrophages in the alveoli. (H&E × 100).

bin 1.0 mg/dl (normal 0.0-0.5), albumin 2.7 g/dl (normal 3.5 –5.5), total protein 4.7 g/dl (normal 6.6-8.7), amylase 400 U/l (normal 0.0-220), calcium 3.8 mg/dl (normal 8.1-10.4), phosphorus 6.3 mg/dl (normal 2.2-5.0), and magnesium 0.3 mg/dl (normal 1.9-2.6). Serum electrolytes: sodium was 125 mmol/l (normal 140-150), potassium 3.4 mmol/l (normal 3.0-5.0), chloride 86 mmol/l (normal 110-115), and bicarbonate 31 mmol/l (normal 21-34).

Virology study data (June 18, 1992) were: measles CF Ab < 1:8, CMV CF Ab < 1:8, HSV CF Ab < 1:8, adeno CF Ab < 1:8, VZ CF Ab < 1:8, influenza (HAI Ab) negative, VZV IgG positive (1.629), and VZV IgM

positive (0.277). Cerebro-spinal fluid contained glucose 76 mg/dl and total protein 0.4 g/dl; VZ CF Ab < 1:4. Skin biopsy (3S-5S) showed non-specific inflammation (haematoxylin & eosin stain); Tzanck smear of skin lesions demonstrated multinucleated giant cells and acanthocytic cells. Culture of vesicular fluid for varicella-zoster and herpes virus were negative. Bronchoscopy performed on June 18, 1992 showed an apparently normal bronchial tree, and negative findings of bronchial lavage fluid (cultures and virology tests) and of lung biopsied tissue (pathological examination; S-5731). Follow-up VZV serology study on June 21, 1992 disclosed positive VZV IgG (0.907) and negative VZV IgM (0.086).

The patient succumbed from respiratory failure on the fifth hospital day. Postmortem examination (S-5808, A-35-156/18) gave findings suggestive of viral interstitial pneumonia (3,4) (Fig. 3-5), but the enlarged liver however, showed only non-specific inflammation.

Additional information on the case includes the history that the patient had been recuperating from bladder carcinoma treated seven months previously, and that he was a long-time heavy smoker.

DISCUSSION

Although chickenpox mainly causes a mild illness in healthy children, it may be severe particularly in immunosuppressed people and in adults; most deaths

are attributable to complications, the most common of which are pneumonia and encephalitis (5).

The clinical presentations of varicella pneumonia of the case described herein are in conformity with those described in other reports. Relevant points are as follows: the patient developed varicelliform eruptions after exposure to patients with varicella; Tzanck test of the skin lesions was positive. Pneumonia emerged six days after onset of the rash (usually 1-6 day (2)), and progressed to dyspnoea while physical findings were minimal and correlated poorly with the extensive distribution of nodular infiltrates on chest radiographs (6), but correlated well with the degree of diffuseness of the rash (7). The patient succumbed from oxygenation failure, a sequel of severe aberration of lung function (8,9). Postmortem examination gave findings compatible with the diagnosis of viral pneumonia. It is conceivable that the virology tests would be affirmative if tests on pair serum were performed. Negative cultures for Varicella-zoster virus, on the other hand, were probably the results of unsuitable timing of specimen collections when the causative virus had already disappeared from the lesions.

Our patient's heavy-smoking condition (9) and post-malignancy status (with potential immune incompetence (10)) might have been risk factors for severe manifestations of varicella and for pneumonia. To the best of our knowledge, our patient reported here is the first authentic case of varicella pneumonia in Thailand.

SUMMARY

A case of varicella pneumonia is reported for the

first time in Thailand. The patient was a 50-year-old man, who contracted varicella along with his two sons. In his case, the infection was very severe and the pneumonic complication followed shortly afterwards. The patient succumbed from respiratory failure, a sequel of a markedly deranged lung function.

REFERENCES

1. Hockbeger RS, Rothstein RJ. Varicella pneumonia in adults: a spectrum of disease. *Ann Emerg Med* 1986; 931-4.
2. Schlossberg D, Littman M. Varicella pneumonia. *Arch Intern Med* 1988; 148:1630-2.
3. Strano AJ. Viral pneumonia. In: Binford CH, Connor DH, eds. *Pathology of tropical and extraordinary diseases*. 2nd ed. Armed Forces Institute of Pathology, Washington DC, 1976:58.
4. Spencer H. *Pathology of the lung*. 3rd ed. New York: Pergamon Press, 1977:202.
5. Joseph CA, Noah ND. Epidemiology of chickenpox in England and Wales, 1967-85. *Br Med J* 1988; 296:673-6.
6. Triebwasser JH, Harris RE, Bryant RE, et al. Varicella pneumonia in adults: reports of seven cases and review of the literature. *Medicine* 1967; 46:409-23.
7. Weinstein L, Meade R. Respiratory manifestations of chickenpox. *Arch Intern Med* 1956; 98:91-9.
8. Harris RE, Rhoades ER. Varicella pneumonia complicating pregnancy: case report and review of the literature. *Obstet Gynecol* 1965; 25:734-6.
9. Ellis ME, Neal KR, Webb AK. Is smoking a risk factor for pneumonia in adults which chickenpox? *Br Med J* 1987; 294: 1002.
10. Permmongkol C, Bovornkitti S, Matangkasombut P. Cell-mediated immune status in patients with bronchogenic carcinoma. *Siriraj Hosp Gaz* 1981; 33:851-7.