CRITICAL CARE

LETTER

Early corticosteroid treatment for severe pneumonia caused by 2009 H1N1 influenza virus

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A pandemic of the 2009 H1N1 influenza A virus infection occurred worldwide in 2009. Some previously healthy patients experienced rapidly progressive pneumonia leading to acute respiratory distress syndrome (ARDS) and even death. The effect of corticosteroids on these severely affected patients is controversial because of a lack of controlled clinical trials [1].

During the pandemic in South Korea, we observed that early, short-term corticosteroid treatment along with oseltamivir seemed to have a dramatic effect on patients with severe pneumonia, and we proposed a new theory for the pathogenesis of acute lung injury in influenza virus infections [2]. In that study, we wanted to evaluate this beneficial effect of corticosteroid treatment through comparative data based on the use or non-use of corticosteroids at two separate hospitals. The subjects of the study were the pneumonia patients who had severe respiratory distress with hypoxemia at presentation or during admission and who thus required oxygen therapy. The conditions of 17 patients (median of 6 years of age, range of 4 to 9) in our hospital (The Catholic University of Korea, Daejeon St Mary's Hospital, Daejeon, South Korea) (use of corticosteroids) and 15 patients (median of 6 years of age, range of 5 to 18) in a neighboring hospital (Chungnam National University Hospital, Daejeon, South Korea) (non-use of corticosteroids) were diagnosed by reverse transcriptase-polymerase chain reaction. The clinical and laboratory characteristics of patients in the two hospitals are shown in Table 1. Our results suggested that the severe pneumonia patients who were treated with corticosteroids showed shortened durations of fever and oxygen therapy, rapid resolution of pneumonic infiltrations, and possibly no progression to ARDS.

It is reported that corticosteroid treatment for adult ARDS patients with 2009 H1N1 virus infection was effective in the improvement of lung injury score [3]. Two recent case series suggest a possible life-saving role of corticosteroids in severely ill adult patients with 2009 H1N1 virus infection unresponsive to other treatments [4,5]. Corticosteroids may not increase the viral load of the patients [4]. To the best of our knowledge, our study may be the first trial addressing an early and preemptive modality before ARDS development in influenza virus infections. Our policy of corticosteroid treatment with a rapid, high-dose (methylprednisolone, 10 mg/kg per day), and short-term (tapered off within a week) schedule did not show any complications in our patients and may avoid the complications that arise from long-term corticosteroid use.

Although rapid corticosteroid treatment for patients with severe pneumonia halted clinical and radiographic exacerbation and possibly prevented progression to ARDS in our series, further controlled clinical trials are needed to evaluate the role of corticosteroids for severely affected patients with influenza virus infections.

Abbreviation

ARDS, acute respiratory distress syndrome.

Competing interests

The authors declare that they have no competing interests.

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Table 1. Clinical and laboratory characteristics of severe pneumonia patients infected with the 2009 H1N1 virus, with and without corticosteroid treatment

Group	With steroids (n = 17)	Without steroids (n = 15)	*P* value
Clinical characteristics			
Mean age, years	6.6 ± 1.5	7.8 ± 3.4	NS
Males/Females, number	13/4	12/3	NS
Duration of fever, days			
Before admission	1.3 ± 0.5	1.3 ± 0.6	NS
Total	2.1 ± 0.8	5.8 ± 4.8	0.009
Hospitalization, days	6.4 ± 1.1	8.5 ± 7.0	NS
Oxygen treatment, days	2.5 ± 0.6	5.1 ± 4.6	0.04
Oseltamivir for less than 48 hours, number (percentage)[a]	17 (100)	13 (93)	NS
Pneumonia, number (percentage)			
Segmental/Lobar	12 (71)	13 (87)	NS
Progression after admission	5 (29)	4 (27)	NS
Intensive care unit care, number (percentage)	0 (0)	4 (27)	0.02
ARDS with ventilator, number (percentage)	0 (0)	2 (13)	NS
Resolution of pneumonia, number (percentage)[b]	15 (88)	7 (43)	0.01
Laboratory findings			
Hemoglobin, g/dL	13.1 ± 1.0	13.2 ± 1.1	NS
Leukocyte, × 10^9/L	11.8 ± 3.6	12.0 ± 5.0	NS
Neutrophil, percentage	83.8 ± 8.0	86.2 ± 12.9	NS
Lymphocyte, percentage	8.8 ± 6.3	7.4 ± 7.5	NS
Monocyte, percentage	6.0 ± 2.3	5.0 ± 3.8	NS
Platelet, × 10^9/L	268 ± 74	246 ± 53	NS
C-reactive protein, mg/dL	3.0 ± 3.1	4.6 ± 3.9	NS
Erythrocyte sedimentation rate, mm/hour	14 ± 8	15 ± 12	NS

Values are presented as mean ± standard deviation unless indicated otherwise. Laboratory findings were obtained at presentation. [a]Number (percentage) of patients who received oseltamivir treatment within 48 hours of fever onset. [b]Number (percentage) of patients who showed complete resolution of pneumonic infiltrations at discharge. ARDS, acute respiratory distress syndrome; NS, statistically non-specific.

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