

Prospect for Immunotherapy in the treatment of human swine influenza

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Original article

Concurrent comparison of epidemiology, clinical presentation and outcome between adult patients suffering from the pandemic influenza A (H1N1) 2009 virus and the seasonal influenza A virus infection

Kelvin K W To, Samson S Y Wong, Iris W S Li, Ivan F N Hung, Herman Tse, Patrick C Y Woo, Kwok-Hung Chan, Kwok-Yung Yuen

Postgrad Med J 2010;**86**:515–521. doi:10.1136/pgmj.2009.096206

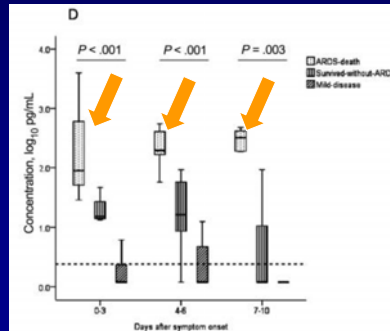
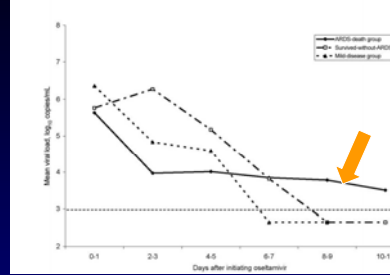
Majority of hospitalized swine flu infection
<65 years old

Severe human swine influenza

Cannot clear virus

Immune dysregulation

Clin Infect Dis. 2010 Mar 15;50(6):850-9.



CHEST

Original Research

INFLUENZA A(H1N1) INFECTION

The Natural Viral Load Profile of Patients With Pandemic 2009 Influenza A(H1N1) and the Effect of Oseltamivir Treatment

Iris W. Li, MD; Ivan F. Hung, MD; Kelvin K. To, MD; Kwok-Hung Chan, PhD; Samson S. Y. Wong, MD; Jasper F. Chan, MD; Vincent C. Cheng, MD; Owen T. Tsang, MD; Sik-To Lai, MD; Yu-Lung Lau, MD; and Kwok-Yung Yuen, MD

CHEST 2010; 137(4):759-768

Early antiviral therapy effective in reducing viral load but doubtful benefits in severe late presenters (beyond 5 days)

Quasispecies of the D225G
Substitution in the Hemagglutinin
of Pandemic Influenza A(H1N1)
2009 Virus from Patients with Severe
Disease in Hong Kong, China

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Kitty S. C. Fung,⁴ Cindy W. S. Tse,⁵ Rodney A. Lee,⁶
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12.5% of severe cases have genetic mutations of the key surface protein of the virus called D225G

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The Journal of Infectious Diseases 2010;201(10):1517–1521

CLINICAL AND VACCINE IMMUNOLOGY, Feb. 2011, p. 305–310
1556-6811/11/\$12.00 doi:10.1128/CVI.00363-10
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Vol. 18, No. 2

The Lower Serum Immunoglobulin G2 Level in Severe Cases than in
Mild Cases of Pandemic H1N1 2009 Influenza Is Associated with
Cytokine Dysregulation⁷

Jasper Fuk-Woo Chan,¹ Kelvin Kai-Wang To,^{1,2,3,4} Herman Tse,^{1,2,3,4} Candy Choi-Yi Lau,¹
Iris Wai-Sum Li,¹ Ivan Fan-Ngai Hung,⁵ Kwok-Hung Chan,¹ Vincent Chi-Chung Cheng,¹
Thomas Sik-To Lai,⁶ Patrick Chiu-Yat Woo,^{1,2,3,4} Eric Yuk-Tat Chan,⁷
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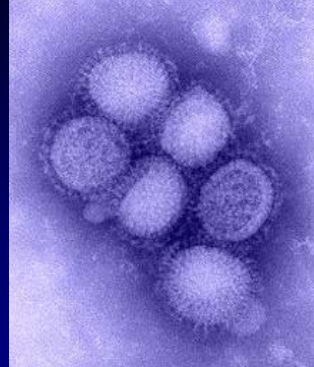
Summary

74 Asian patients: 38 severe vs. 36 mild

Severe group had lower IgG2 level
(3.55g/L vs. 4.75g/L; $P = 0.002$)

Higher cytokine level (more inflammation) →
Lower IgG2 level
($P = 0.029$)

Low IgG2 level NOT related to genetic
predisposition



Conclusion: Chaos in the immune system leads to lower antibody levels in severe human swine influenza

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MAJOR ARTICLE

Convalescent Plasma Treatment Reduced Mortality in Patients With Severe Pandemic Influenza A (H1N1) 2009 Virus Infection

Ivan FN Hung,^{1,2} Kelvin KW To,¹ Cheuk-Kwong Lee,³ Kar-Lung Lee,⁴ Kenny Chan,⁵ Wing-Wah Yan,⁵ Raymond Liu,⁶ Chi-Leung Watt,⁷ Wai-Ming Chan,⁸ Kang-Yiu Lai,⁹ Chi-Kwan Koo,¹⁰ Tom Buckley,¹¹ Fu-Loi Chow,¹² Kwan-Keung Wong,¹³ Hak-Sum Chan,¹⁴ Chi-Keung Ching,¹⁵ Bonne SF Tang,¹⁶ Candy CY Lau,¹ Iris WS Li,¹ Shao-Haei Liu,¹⁷ Kwok-Hung Chan,¹ Che-Kit Lin,² and Kwok-Yung Yuen¹

Use of Convalescent Plasma in Influenza • CID 2011;52 (15 February) • 447

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Summary

Sept 2009 to June 2010

93 patients with severe swine flu

20 patients received plasma treatment

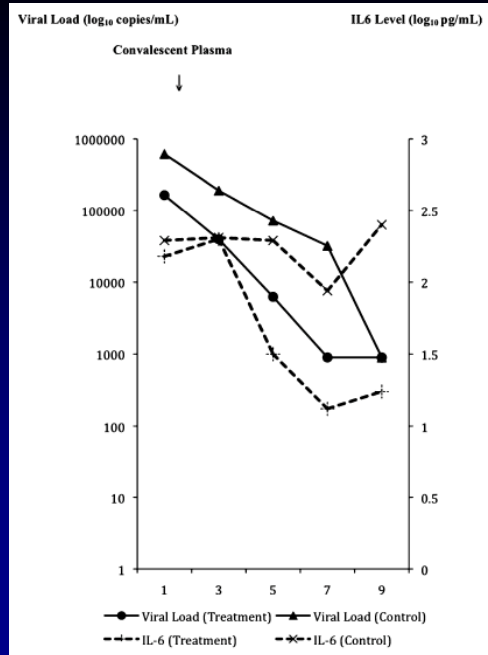
Plasma treatment group:

- Less death (20% vs. 54.8%)
- Lower serial viral load and cytokine level ($P < 0.05$)



Conclusion: Immunotherapy can boost up the immunity and reduce the viral load

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Clin Infect Dis 2011;52

This Winter

- More severe influenza epidemic in Hong Kong
- Longer period of cold and dry weather
- Enhance virus survival and increased transmission and higher inoculums
- 2-4 fold decrease in antibody titer in previously infected population in 2009

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Impact of the Two Studies

- Severe swine flu cases presented beyond 5 days of onset of symptoms: antiviral not effective
- High viral load  Immune dysfunction  low IgG2
- Replacement of virus neutralizing antibody and IgG2 will reduce viral load and secondary bacterial infection
- Strongly supported by the convalescent plasma study
- On-going clinical trial of the hyperimmune IVIG prepared from convalescent plasma

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Thank you !

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