

Influenza

Effects of Oseltamivir (Tamiflu) on Faster Resolution of Symptoms in Patients with Influenza

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Influenza

- Common health concern that occurs annually
- Affects more than 10-20% of population
 - Each year more than 114,000 individuals are hospitalized
 - 500,000 cases lead to death
- Cost the US approximately \$14.6 billion dollars in 1993
 - \$1.4 billion in direct expenses
 - \$13.2 billion in indirect expenses

Influenza

- Etiology/Risk Factors
 - Orthomyxovirus – a contagious respiratory illness caused by either the influenza A or B virus
 - Transmitted by droplet nuclei
 - Affects every age group
 - Children under 2 years
 - Elderly (65 years and older)
 - Immunocompromised
 - Most fatalities are due to development of bacterial pneumonia

Influenza

- Signs/Symptoms
 - Fever, chills, and malaise
 - Myalgias
 - Headache
 - Infants may appear septic and present with GI symptoms
 - Elderly present with confusion and fatigue, often without a fever
- Diagnosis
 - CBC to look for leukopenia
 - Rapid lab tests from nasal and throat swabs are becoming more widely available

Influenza

- Nasal and Throat Swabs
 - Collect samples within first 4 days of illness
 - Rapid tests – 30 minutes or less
 - Viral culture – 3-10 days
 - 70% sensitivity and 90% specificity for detecting influenza
 - False negative more common than false positive, especially during peak influenza season
 - CDC recommends testing by both rapid test and viral culture

Influenza

- Treatment Options
 - Antiviral therapy
 - M2 ion channel blockers (amantadine and rimantadine)
 - Neuraminidase inhibitors (zanamivir and oseltamivir)
 - Bind to the neuraminidase protein (promotes release of the virus) and inactivates it to inhibit replication
 - Vaccination against influenza A and B remains the gold standard of care for the prevention of influenza!

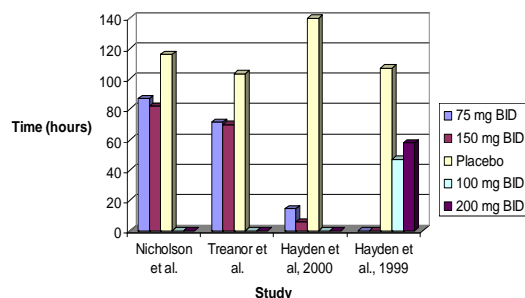
Summary of key evidence/results

- Nicholson et al., 2000
 - 75 or 100 mg twice daily or placebo
 - Significant clinical and antiviral effects in healthy adults with naturally occurring influenza
 - Oseltamivir was generally well tolerated
- Hayden et al., 1999
 - Prophylaxis group – 100 mg daily, 100 mg twice daily or placebo
 - Treatment group – 100 mg twice daily, 200 mg once daily, 200 mg twice daily, or placebo
 - Oseltamivir provided significant antiviral, biochemical, and clinical effects in experimental human influenza virus infection

Summary cont.

- Treanor et al., 2000
 - 75 mg or 150 mg twice daily or placebo
 - Oseltamivir reduces the duration and severity of acute influenza in healthy adults
- Hayden et al., 2000
 - 3 studies
 - 75 mg or 150 mg twice daily or placebo in all studies
 - Oseltamivir has significant antiviral efficacy in experimental human influenza

Time to Viral Shedding Measured in Hours in Oseltamivir vs. Placebo



Conclusion

- Available data on oseltamivir shows it is an effective drug when administered orally for the treatment of influenza
- Generally well tolerated
- Oseltamivir helpful in reducing duration of symptoms for patient populations in whom vaccination is unsuitable or ineffective or for those who do not receive the vaccination and contract influenza

Clinical/Recertification Pearls

- Classic symptoms of influenza
 - Sudden onset of headache, fever, chills, and myalgias
- Tamiflu
 - Recommended dosing: once daily for prophylaxis x 10 days, twice daily for treatment x 5 days
 - <33 lbs. – 30 mg
 - >51 lbs. – 45 mg
 - 51-88 lbs. – 60 mg
 - >88 lbs. – 75 mg
 - Up to 85% effective for preventing influenza when administered within 48 hours of exposure
 - Most common side effect: GI tract symptoms such as nausea and vomiting
- Vaccination is #1 prevention!

References

- McClellan K, Perry, CM. Oseltamivir: A Review of its Use in Influenza. *Drugs* 2001; 61: 263-268.
- Schmidt AC. Antiviral Therapy for Influenza: A Clinical and Economic Comparative Review. *Drugs* 2004; 64: 2031-2046.
- Centers for Disease Control and Prevention. Seasonal Flu. Centers for Disease Control Website. Available at: <http://www.cdc.gov/flu/>. Accessed online May 2, 2007.
- Tierney LM, McPhee SJ, Papadakis MA. *Current Medical Diagnosis and Treatment*. 46th ed. New York, NY: McGraw-Hill; 2007:1413-1415.
- Quick Access. Influenza. 2007 *Current Consult: Medicine*. New York, NY: McGraw-Hill; 2006. Available at: <http://www.accessmedicine.com.proxy3.usd.edu/content.aspx?aiD=2588704&searchStr=influenza>. Accessed online May 2, 2007.
- Cooper NJ, Sutton AJ, Abrams KR, Walloo A, Turner D, Nicholson KG. Effectiveness of neuraminidase inhibitors in treatment and prevention of influenza A and B: systematic review and meta-analyses of randomized controlled trials. *British Medical Journal* 2003; 326: 1235-1241.
- Demicheli JV, Rivetti D, Jones M, Pietranonji CD, Rivetti A. Antivirals for influenza in healthy adults: systematic review. *Lancet* 2006; 367: 303-313.
- Whittay RJ, Hayden FG, Reisinger KS, Young N, Dutkowski R, Ipe D, Mills, RG, Ward P. Oral oseltamivir treatment of influenza in children. *Pediatr Infect Dis J* 2001; 20: 127-33.
- Oo C, Barrett J, Hill G, Mann J, Dorr A, Dutkowski R, Ward P. Pharmacokinetics and Dosage Recommendations for an Oseltamivir Oral Suspension for the Treatment of Influenza in Children. *Paediatr Drugs* 2001; 3: 229-236.
- Dreitlein WB, Maratos J, Brocovich J. Zanamivir and Oseltamivir: Two New Options for the Treatment and Prevention of Influenza. *Clinical Therapeutics* 2001; 23: 327-355.
- Nicholson KG, Aoki FY, Osterhaus ADME, Trotter S, Carvicio O, Merlier CH, Rode A, Kinnersley N, Ward P. Efficacy and safety of oseltamivir in treatment of acute influenza: a randomized controlled trial. *Lancet* 2000; 355: 1845-1850.
- Treanor JJ, Hayden FG, Vrooman PS, Barbarash R, Bettis R, Riff D, Singh S, Kinnersley N, Ward P, Mills RG. Efficacy and Safety of the Oral Neuraminidase Inhibitor Oseltamivir in Treating Acute Influenza: A Randomized Controlled Trial. *JAMA* 2000; 283: 1016-1024.
- Hayden FG, Treanor JJ, Fritz RS, Lobo M, Betts RF, Miller M, Kinnersley N, Mills RG, Ward P, Straus SE. Use of the Oral Neuraminidase Inhibitor Oseltamivir in Experimental Human Influenza: Randomized Controlled Trials for Prevention and Treatment. *JAMA* 1999; 282: 1240-1246.
- Hayden FG, Jennings L, Robson R, Schiff G, Jackson H, Rana B, McClelland G, Ipe D, Roberts N, Ward P. Oral oseltamivir in human experimental influenza B infection. *Antiviral Therapy* 2000; 5: 205-213.