Pathogenesis and Prevention. Philadelphia, PA: The Franklin Institute Press; 1978.
5. Centers for Disease Control and Prevention. Outbreaks of hepatitis B virus infection among hemodialysis patients—California, Nebraska, and Texas. *MMWR* 1996;45:285-289.
6. Garner JS, the Hospital Infection Control Advisory Committee. Guideline for isolation precautions in hospitals. *Infect Control Hosp Epidemiol* 1996;17:53-80.
7. Alter MJ, Ahtone J, Maynard JE. Hepatitis B virus transmission associated with a multiple-dose vial in a hemodialysis unit. *Ann Intern Med* 1983;99:330-333.
8. Carl M, Francis DP, Maynard JE. A common-source outbreak of hepatitis B in a hemodialysis unit. *Dialysis and Transplantation* 1983;12:222-229.
9. Bond WW, Favero MS, Petersen NJ, Gravelle CR, Ebert JW, Maynard JE. Survival of hepatitis B virus after drying and storage for one week. *Lancet* 1981;1:550-551.
10. Crosnier J, Jungers P, Courouce AM, Laplanche A, Benhamou E, Degos F, et al. Randomised placebo-controlled trial of hepatitis B surface antigen vaccine in French haemodialysis units: II, haemodialysis patients. *Lancet* 1981;1:797-800.
11. Stevens CE, Alter HJ, Taylor PE, Zang EA, Harley EJ, Szmuness W. Hepatitis B vaccine in patients receiving hemodialysis. Immunogenicity and efficacy. *N Engl J Med* 1984;311:496-501.
12. Alter MJ, Favero MS, Francis DP. Cost benefit of vaccination for hepatitis B in hemodialysis centers. *J Infect Dis* 1983;148:770-771.
13. Centers for Disease Control. Recommendation of the Immunization Practices Advisory Committee (ACIP). Inactivated hepatitis B virus vaccine. *MMWR* 1982;31:317-322,327,328.

Pesticide-Resistant Lice Found in US

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Pediculiasis is treated aggressively in the United States, mainly with permethrin- and pyrethrin-containing pediculicides. Increasingly frequent anecdotal reports of treatment failure suggest the emergence of insecticidal resistance by lice. Pollack and colleagues from the Harvard School of Public Health have verified that, in this country, there are head lice that are not susceptible to one of the most frequently used pediculicides.

The researchers collected head lice from infested patients in Massachusetts and Idaho. All patients had been previously treated with pediculicides containing pyrethrins or permethrin. Samples were also collected from patients in Sabah (Malaysia Borneo), where such products are essentially unknown. In a laboratory, the lice collected from the two US sites were exposed to progressively higher doses of permethrin but were not killed by it. In comparison, the lice collected from patients in Sabah were quickly killed by permethrin.

When the lice from Borneo were exposed to permethrin, there was a classic dose response: the greater the dosage of permethrin, the more effective it was at killing the lice. In comparison, the dose-response curve in the lice from US patients was relatively flat, indicating that a larger dose was no more effective than a smaller dose. These findings have implications for the treatment of lice in the United States. Traditionally, if over-the-counter medications failed to kill lice, patients would seek prescription-only alternatives.

Some prescribed medications contain a higher concentration of permethrin. Alternatives to permethrin include pediculicides containing lindane and malathion, available by prescription.

Permethrin is a synthesized pyrethroid chemical formulation. Other over-the-counter anti-louse therapies contain related chemicals such as synergized pyrethrum extracts. These act similarly to permethrin but are chemically different. This research does not address the efficacy of synergized pyrethrum extracts.

Grooming and over-the-counter pediculicides still remain the first choices for eradication.

Pollack and colleagues maintain a head lice information resource on the Internet (http://www.hsph.harvard.edu/headlice.html) containing information about the life stages of head lice and what is known about treatment methods.

FROM: Pollack RJ, Kiszewski A, Armstrong P, Hahn C, Wolfe N, Rahman HA, et al. Differential permethrin susceptibility of head lice sampled in the United States and Borneo. *Arch Pediatr Adolesc Med* 1999; 153:969-973.

Candida glabrata Fungemia

Candida species are the fourth leading cause of nosocomial bloodstream infection in hospitalized patients, and non-*Candida albicans* species now surpass *C albicans.* The clinical features of the most common non-*C albicans* species, *Candida (torulopsis) glabrata,* have not been well studied. Gumbo and coinvestigators from the Department of Infectious Disease, Cleveland Clinic Foundation, Cleveland, Ohio, retrospectively reviewed the clinical features of 139 patients with *C glabrata* bloodstream infection over a period of 7 years. The mean age of patients was 62 years, and the most common admitting diagnoses were malignancy (28%) and coronary artery disease (18%). The most common identified portals of entry were abdominal (22%) and intravascular catheters (16%). At the time of fungemia, 63% of patients had fever, 45% had change in mental status, and 30% were in septic shock. Three of 50 patients examined by an ophthalmologist had chorioretinitis. The overall hospital mortality was 49%. Factors associated with increased mortality in a regression model were prior abdominal surgery and an elevated creatinine. When early deaths (<72 hours) were censored, amphotericin B treatment and total dose were associated with reduced mortality. The authors conclude that nosocomial *C glabrata* fungemia is not just a disease of debilitated and neutropenic patients but affects a wide variety of patients and is associated with a high mortality.

FROM: Gumbo T, Isada CM, Hall G, Karafa MT, Gordon SM. *Candida glabrata* fungemia. Clinical features of 139 patients. *Medicine (Baltimore)* 1999;78:220-227.