

Bedbugs: Awareness is key

IN 2004, knowing of my medical interest in arthropods, a resident came to my office to discuss an “unusual case” of pubic louse infestation seen at another hospital: a middle-aged woman had been afflicted for months with a skin eruption with excoriation and impetigo that involved the arms and legs but not the pubic area.

See related article, page 207

In a bag, the resident had a dead insect, 5 mm in length, with a brown, lens-shaped body and short hairs on the pronotum that were visible with a hand lens. An attending dermatologist at the other hospital had identified the insect—incorrectly—as a pubic louse.

With deference, I informed the resident that I did not share the opinion that this was a pubic louse, unless the insect represented a new “Cleveland variant” of the species (a reference to the 1975 Bruce Maness sci-fi film, *The Tomato That Ate Cleveland*). Rather, I stated, “I believe this is a bedbug, but I have not seen many specimens.”

In hindsight, these words were prophetic, for since 2004, the incidence of bedbug infestations has remarkably surged.¹ The trend has not abated, making the review by Ibrahim et al in this issue of the *Cleveland Clinic Journal of Medicine* timely for all practitioners.²

■ BEDBUGS ARE BACK...

Bedbugs have plagued man for millennia. In 1939, it was estimated that 4 million Londoners (in a city of 8.5 million) were bitten by bedbugs each night.³ However, as Ibrahim et al describe, long-acting pesticides introduced during World War II dramatically reduced infestation rates. By 1997, some college entomology programs reported difficulty in locating a single teaching specimen.⁴

doi:10.3949/ccjm.84a.17001

The modern resurgence of bedbugs is multifactorial, including a ban on long-acting pesticides such as dichlorodiphenyltrichloroethane (DDT), as well as population growth and increased travel. In days past, bedbug infestations may have pertained to hygiene and social status. But today, travel is a major factor in the resurgence, and bedbugs now affect a broader segment of the population, including the affluent—something that must be kept in mind in the clinical setting.⁵

■ ...AND THEY'RE EVERYWHERE

Many prominent US cities are experiencing near-epidemic numbers of bedbug infestations (Table 1). Bedbug infestations occur not only in homes and hotel rooms, but also in hospitals,⁶ office buildings,⁷ movie theaters,⁸ schools,⁹ and even on subways and trains,¹⁰ expanding the number of people potentially exposed.

Understanding that bedbugs affect more than people who are in bed, or with hygiene challenges, Ibrahim et al describe the presentation of bedbug bites—useful information for all practitioners, regardless of medical specialty.

Bedbugs bite skin that is exposed during sleep (ie, the distal extremities and the head, face, and neck). Quasilinear bites, in groups of three (the notorious “breakfast, lunch, and dinner” sign) are a good clue to remember. Unusually exuberant reactions to bedbug bites may be confused with autoimmune bullous conditions or primary vasculitides.¹¹

■ NOT ALL WHO ARE BITTEN HAVE REACTIONS

Intricate entomologic studies have shown that substances in bedbug saliva drive bite reactions.^{12,13} However, as Ibrahim et al mention, not all bites provoke a reaction in all persons.

Bedbugs are a problem all healthcare providers should be familiar with, regardless of specialty

This fact cannot be overstated, for providers in primary care and urgent and emergency care settings may have learned to ask questions about scabies such as, “Are other persons in the household similarly affected?” While it is uncommon for a person with scabies *not* to present with visible skin lesions, one does not want to misinterpret this historical detail in the setting of bedbug bites. If one person in a household has lesions and another does not, this does not exclude a bedbug infestation!

Ibrahim et al emphasize that treatment of bedbug bites is supportive in nature. Most often, extermination in the home or any other setting should be conducted by professionals. During travel, prevention by inspection is widely advocated.⁵ There has been interest in using oral ivermectin in affected patients to adversely affect the bedbug colony, but to date, early experiments have encountered daunting pharmacokinetic concerns.¹⁴

PSYCHOLOGICAL AND OTHER SEQUELAE

A final consideration in bedbug infestations is any lasting sequelae beyond the bites themselves. Bedbug infestations severe enough to cause anemia and exacerbate or trigger adverse cardiac events have been reported.¹⁵ While bedbugs carry human pathogens such as methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus faecium*, hepatitis B virus, *Bartonella quintana*, and *Trypanosoma cruzi*, Ibrahim et al correctly inform the reader that there are no compelling reports of trans-

TABLE 1

2016 Top 10 US cities for bedbug infestation

| Rank | City | Change in rank from 2015 |
|------|------------------------------------|--------------------------|
| 1 | Baltimore, MD | +9 |
| 2 | Washington, DC | +1 |
| 3 | Chicago, IL | -2 |
| 4 | New York, NY | No change |
| 5 | Columbus, OH | No change |
| 6 | Los Angeles, CA | -4 |
| 7 | Detroit, MI | No change |
| 8 | Cincinnati, OH | No change |
| 9 | Philadelphia, PA | -3 |
| 10 | San Francisco-Oakland-San Jose, CA | +4 |

Based on data from Orkin Pest Control; the full list of 50 cities is available at www.orkin.com/press-room/dont-let-the-bed-bugs-bite-orkin-releases-new-top-50-cities-list/

mission of these diseases via bedbug bites.¹⁶

However, there may be lasting psychological sequelae. Anxiety, hypervigilance, insomnia, avoidance behaviors, and personal dysfunction can persist, even long after the infestation has been eradicated.

Bedbugs are a national and even global health problem worthy of familiarity by all healthcare providers, regardless of specialty. In this regard, Ibrahim et al succinctly and accurately provide a functional and clinically useful guide.

REFERENCES

- Alalawi AH. Bed bugs epidemic in the United States. *Entomol Ornithol Herpetol* 2015; 4:143–148.
- Ibrahim O, Syed UM, Tomecki KJ. Bedbugs: a practical review. *Clev Clin J Med* 2017; 84:207–211.
- Velten H. *Beastly London—A History of Animals in the City*. London: Reaktion Books. November 15, 2013. p. 221.
- Snetsinger R. Bed bugs and other bugs. In: Moreland D, editor. *Mallis Handbook of Pest Control: The Behavior, Life History, and Control of House Pests*, 8th edition. Cleveland, OH: GIE Publishers, 1997:392–424.
- Kolb A, Needham GR, Neyman KM, High WA. Bedbugs. *Dermatol Ther* 2009; 22:347–352.
- Totten V, Charbonneau H, Hoch W, Shah C, Sheele J. The cost of decontaminating an ED after finding a bed bug: results from a single academic medical center. *Am J Emerg Med* 2016; 34:649.
- Baumblatt JA, Dunn JR, Schaffner W, Moncayo AC, Stull-Lane A, Jones TF. An outbreak of bed bug infestation in an office building. *J Environ Health* 2014; 76:16–18.
- Chalupka S. Preventing bedbug infestation. *AAOHN J* 2010; 58:500.
- Scisicione P. Bed bugs: they are back! The role of the school nurse in bed bug management. *NASN Sch Nurse* 2012; 27:268–273.
- Anders D, Brocker EB, Hamm H. *Cimex lectularius*—an unwelcome train attendant. *Eur J Dermatol* 2010; 20:239–240.
- deShazo RD, Feldlaufer MF, Mihm MC Jr, Goddard J. Bullous reactions to bedbug bites reflect cutaneous vasculitis. *Am J Med* 2012; 125:688–694.
- Potter MF, Haynes KF, Deutsch M, et al. The sensitivity spectrum: human reactions to bed bug bites. *Pest Control Technology Magazine* 2010; 70–75.
- Reinhardt K, Kempke D, Naylor RA, Siva-Jothy MT. Sensitivity to bites by the bedbug, *Cimex lectularius*. *Med Vet Entomol* 2009; 23:163–166.
- Sheele JM, Anderson JF, Tran TD, et al. Ivermectin causes *Cimex lectularius* (bedbug) morbidity and mortality. *J Emerg Med* 2013; 45:433–440.
- Paulke-Korinek M, Széll M, Laferl H, Auer H, Wenisch C. Bed bugs can cause severe anaemia in adults. *Parasitol Res* 2012; 110:2577–2579.
- Ho D, Lai O, Glick S, Jagdeo J. Lack of evidence that bedbugs transmit pathogens to humans. *J Am Acad Dermatol* 2016; 74:1261.

ADDRESS: Whitney A. High, MD, JD, MEng, University of Colorado School of Medicine, 12635 East Montview Boulevard, Aurora, CO 80045; whitney.high@ucdenver.edu