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Picobirnavirus

Picobirnavirus was previously thought to cause diarrhea in animals; however, human cases of picobirnavirus-associated diarrhea have been reported in Brazil (1).

Parvovirus

Parvovirus are ss DNA viruses that are 20 nm in diameter, nonenveloped, icosahedral, and not culturable in vitro. Parvoviruses are most recognized for causing numerous diseases in animals and erythema infectiosum (fifth disease) in children. However, parvoviruslike particles have been observed (by EM) in the stools of gastroenteritis patients and healthy individuals, and have been associated with shellfish-related gastroenteritis (1).

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Editorial

Infectious Wastes: Myths and Realities

Donald Vesley, Ph.D.
Professor
University of Minnesota School of Public Health
Minneapolis, MN 55455

Public concern over potentially hazardous solid wastes of hospital/medical origin peaked in the summer of 1988, prompted by highly publicized incidents of such wastes washing ashore on a variety of the nation's beaches.

Undoubtedly, concern was fueled by the growing fear of AIDS and public inability to distinguish between genuinely infectious wastes and other items that looked bad but were only of aesthetic concern. Nationally, there was a demand for regulatory action, and the American politicians were only too anxious to respond. The federal Medical Waste Tracking Act of 1988 (Luken Bill) was passed and many, often restrictive, state laws followed. The race was on to save the nation from the "evils" of infectious waste.

Hospitals and other medical facilities have been caught in a crossfire

which threatens to add considerably to the already skyrocketing costs of medical care. Attempts to apply principles of logic and scientific evidence to arrive at reasonable approaches to managing medical wastes are being thwarted by extreme application of the NIMBY (not in my backyard) principle. We are left with a hodgepodge of inefficient, environmentally unsound, and sometimes outright ridiculous practices in place of sensible solutions. For example, some two-thirds of American hospitals are currently incinerating their wastes onsite. Many of these incinerators are old, inefficient,

and located in populous areas. Few can meet current air-pollution emission standards. Hospitals are obviously reluctant to undertake expensive emission control retrofitting in the face of an uncertain regulatory future. Thus, they continue to operate these incinerators for want of anything better. On the ridiculous side, some hospitals are shipping their waste long distances for out-of-state incineration because local landfills and incinerators refuse to accept it regardless of previous decontamination treatment. The fact is that there is no scientifically based rationale why decontaminated infectious waste cannot be landfilled (although there are good reasons why landfills are generally being phased out in many locales). Similarly, there is no scientific rationale why infectious waste (decontaminated or not) cannot be burned in community mass burn incinerators. Yet these facilities frequently refuse to accept not only infectious waste, but often any recognizable medical waste. The concept of regional mass burn medical waste incinerators has emerged as a potential solution in some areas. However, if the Minnesota experience is any indication, even that concept appears to be in serious trouble. A consortium of hospitals in the Twin Cities metropolitan area has been attempting to site a joint venture regional incinerator as a responsible solution to the medical waste problem. At every turn the project has run into the NIMBY obstacle and is now running out of options.

Environmental groups that are spearheading the anti-incinerator movement frequently call for the exploration of alternative solutions. However, close examination of these alternatives leads one to wonder if anything better is really on the horizon. Microwaving, dielectric heating, and hammermill grinding are frequently cited alternatives. All of these options incorporate a shredding process prior to decontamination, which does resolve the recognizability issue and results in volume reduction. However, the result is an equivalent (or greater if water is added) weight of material to be burned or buried with no alteration of its chemical content

(which does, after all, pose more of a threat to the environment than infectious agents). Additionally, the shredding process can potentially aerosolize infectious agents and thus requires containment via HEPA filtration at considerable added cost. It is ironic that even these alternative methods are meeting opposition from the NIMBY mentality.

The other point frequently raised by opposition groups is the need for waste reduction and recycling. Indeed, for community solid waste this is a very popular concept, and serious efforts are now being made toward this end. Markets for recycled materials are being developed, plastics are being included for the first time, and we seem to be making real progress toward increasing the percentage of waste recycled from the current 15% toward a possibly achievable 50% or more. However, for medical waste and particularly for infectious waste, the problem is more complicated. Application of universal precautions has increased the volume of gloves, gowns, etc. used in hospitals and clinics. Infection control generally requires and benefits from single use as opposed to reusable items. Sharps disposal requires heavy duty puncture-resistant containers that add to the waste volume. All of these developments appear to work in the direction opposite from waste reduction. However, current estimates indicate that only 0.3% of the nation's annual output of 158 million tons of municipal solid waste is medical, thus lessening the total impact (1). Certainly, some steps can be taken relative to medical waste stream content. For example, manufacturers should be encouraged to develop more burnable plastics with lower chlorine content. Batteries and other mercury-containing products can be kept out of the waste stream. Perhaps a way can be found to separate out heavy metals before incineration (they are not a major component of infectious wastes anyway).

Where does all this leave us in terms of current myths and realities relative to infectious waste? Perhaps the most important myth is that the public is threatened with grave consequences of disease transmission by

medical wastes of any kind. While it is very difficult to prove a negative, the reality is that no such transmission has ever been demonstrated. This has been confirmed most recently by the congressionally mandated report of the Agency for Toxic Substances and Disease Registry (ATSDR) (2). There are some potential occupational health risks, particularly from needle sticks, and it is possible to devise scenarios whereby the public could be threatened; but conventional approaches to waste handling are adequate to afford reasonable public health protection. We must also take into consideration the large volumes of medical waste now being generated outside of conventional health care settings, particularly in the home. Such generation is obviously more difficult to control and has not been studied extensively.

The second myth is that medical/infectious waste must be separated from the community solid waste stream and cannot be accepted by municipal landfills or incinerators. Again, there is no ecological or public health reason for that action, assuming that genuinely infectious materials have been decontaminated onsite to eliminate occupational handling hazards.

One reality that must be faced by anyone trying to dispose of medical/infectious waste is that public perception of these items as an unacceptable hazard is making *any* offsite option difficult to sell. The rational separation of infectious waste from other medical waste is of little value in this regard because the public simply does not make that distinction for anything that looks medical. Thus, it appears that some sort of shredding process to render the waste unrecognizable will have to precede any movement of the waste offsite.

Regardless of this perception problem, the categorization of waste as "infectious" is of value in terms of safe management. There now seems to be general consensus on most such categories, which can be summarized as follows: (i) Stocks and cultures of infectious agents: It has long been accepted that these wastes should be decontaminated, preferably onsite by

steam sterilization. While they can then be disposed of safely in landfills or by any other means, they do remain identifiable and thus the reality is that they will have to be shredded to move offsite. (ii) Needles and sharps: It is well recognized that these items pose a genuine occupational threat if mishandled. The consensus is that they should be collected in puncture resistant containers and remain there until disposed of. Clearly, incineration is the most sensible means of handling sharps. But again we will probably have to resign ourselves to some sort of shredding process along the way to final disposal. (iii) Blood and blood products: Anything that looks bloody is going to arouse maximum public resistance. It is perfectly sensible to dispose of liquid blood into the sewer, assuming that the system includes secondary treatment of community wastewater. Blood bags or other containers and bloody dressings can best be incinerated, but again will most likely be subject to the shredding process first.

(iv) Deliberately infected animal carcasses: While research animal carcasses can usually be rendered safe (especially the larger animals), any known infected carcasses should be containerized and incinerated. Even the most radical environmentalists will probably not insist on prior shredding of carcasses as the aesthetics are hardly improved by mutilation. (v) Pathological specimens: Although not strictly infectious, pathological specimens are rightfully separated from general waste for aesthetic reasons. As with animals, there is no pressure to shred them and there is considerable acceptance of incineration. However, calling the process "cremation" seems to elicit considerably less opposition. Perhaps siting problems could be eased if infectious waste burners were called crematoria rather than incinerators.

What conclusions can we draw relative to future directions for this problem? There is no obvious immediate solution on the horizon. However, even the most intractable problems

have a way of sorting themselves out over time by an evolutionary process that makes us wonder later what all the fuss was about. I predict that this will happen to infectious waste.

Some combination of successful waste reduction, continued reliance on old standby methods, changing public perception, and perhaps the emergence of an alternative technology as yet unenvisioned will eventually carry the day.

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Case Report

Neisseria sicca and *Streptococcus sanguis* I Endocarditis in an Intravenous Drug User

Ribhi M. Shawar, Ph.D.
Mark T. LaRocco, Ph.D.
Department of Pathology and Laboratory Medicine

Randall R. Reves, M.D.
Department of Medicine and the School of Public Health
University of Texas Health Science Center
Houston, TX 77030

Typically endocarditis is caused by a single organism, although polymicrobial infections are more commonly encountered in intravenous (IV) drug abusers (1). Streptococci are the leading cause of bacterial endocarditis, accounting for more than 45% of all cases. Of these, *Streptococcus sanguis* biotypes I and II are the viridans strep-

tococci most commonly encountered (2, 3). *Neisseria sicca*, on the other hand, is considered nonpathogenic and of low virulence. We report here a case of polymicrobial endocarditis due to both of these organisms that occurred in an IV drug abuser. The relative frequency of endocarditis caused by these organisms is discussed. The unusual presentation of this case and its possible relationship to *N. sicca* is also addressed.

Case Report

A 31-yr-old woman with a 2-yr history of cocaine abuse was admitted to the hospital from the emergency clinic with a 2-wk febrile illness that began with upper respiratory tract symptoms. A physician had prescribed oral cephalexin when fever, chills, and cough productive of greenish sputum subsequently developed. She discontinued the medication, and after 2 d of emesis and watery diarrhea came to the emergency clinic. She had lost over 10

pounds during the illness but denied headache, nuchal rigidity, rash, arthralgias, and genitourinary tract symptoms. Her past history was negative except for two normal vaginal deliveries. She denied a prior history of infection with or exposure to hepatitis or human immunodeficiency virus (HIV). She denied sharing needles but described rinsing the needle with tap water after alcohol cleaning. The admission temperature was 40.2°C, pulse 129/min, and blood pressure 76/40 mm Hg. She was a thin, acutely ill woman with obvious needle tracks but no petechiae or embolic skin lesions. Conjunctivae were pale and funduscopic exam normal. The neck was supple without jugular venous distention. A grade III/VI holosystolic murmur was present at the left sternal border and a fourth heart sound was audible. The chest exam was normal. The abdomen was not distended, with audible bowel sounds but diffusely tender to palpation. No organomegaly was present.