Correspondence

Antimicrobial Storage and Antibiotic Resistance

To the Editor: The astounding scenario responsible for emergence and dissemination of antimicrobial resistance[1] is operational in poor and richer communities alike. To address the issue universally, it is important to appreciate the recommendations for storage of antimicrobials. They require constant storage at controlled temperatures ranging from sub-zero to 10°C to 25°C.[2] They are inadvertently subjected to harsh environment before administration to patients with a reduced effective potency. That is not an exclusive episode in poor countries. During the 1995 heat wave in Chicago, the temperature was 40°C, but the heat index, an estimate of evaporative and radiative transfer of heat, was 48.3°C.[3] Different agencies collaborated to minimize the harmful effects of heat on humans: the therapeutics including antimicrobials were ignored. Furthermore, electrical appliances are essential toward maintenance of constant temperature. Although erratic power supply is a rule rather than an exception in poor countries, the picture during the Hurricane Katrina in New Orleans during 2005 was shocking. The prolonged power cut was accompanied with auxiliary generators running out of fuel.[4] Prospective research in the United States or elsewhere to establish the factors responsible for antimicrobial failures[1] should investigate their storage practices in warehouses, physician's offices, and pharmacy and non-pharmacy sites. In the interim phase, the storage specifications on antimicrobial containers should as well bear distinct symbols indicating the recommended storage temperature. That should not be an insurmountable task because distinct marks are mandatory for containers of poisons, radioactive materials, and inflammables and are in universal usage.

The quality of antimicrobials in actual usage by any patient would be best measured at the point of usage. Rather than multistep tests with costly equipment, simpler assays without highly trained personnel or sophisticate equipment are needed on a priority basis. Fiscal input toward improved versions of field and simpler assays for paracetamol or rapid spectrophotometer analysis for antimalarial formulations[5,6] directed toward antimicrobials would be cost-effective.

Planta's[1] recommendation to individual hospitals and health care centers to monitor antimicrobial susceptibility of prevailing isolates is commendable and worth emulation. A syndrome-wise categorization of efficient oral and parenteral antimicrobials would interest the clinician toward their rational selection of antimicrobials while awaiting laboratory results on clinical samples. At a 140-bed private, tertiary care, multispecialty hospital in Delhi, a syndrome-wise categorization has been operational since 2004.[7] Rather than relying on fourth-generation cephalosporin in aggressive infection, hospitalized cases would be offered alone or in combination from meropenem, piperacillin-tazobactam, amoxicillin-clavulanic acid, and amikacin.[8]

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Response to Issue of Antimicrobial Storage

To the Editor: Arya writes that improper storage of antimicrobials may affect their potency and contribute to resistance. This is an important issue and is a known issue with respect to vaccines. However, Arya starts with some faulty and unsubstantiated premises.

First, very few commonly used antibiotics in the outpatient setting in the Unites States require constant storage at sub-zero temperatures.

Then the author fails to substantiate the statement "they are inadvertently subjected to harsh environment before administration to patients. . . . " The author also fails to substantiate the supposition that a harsh environment leads to "a reduced effective potency."

The author implies that the 1995 heat wave in Chicago affected the quality of medications, especially antimicrobials. I was present in Chicago as a medical student during this heat wave. What the author fails to realize is that hospitals and pharmacies are air-conditioned, very few areas lost power, and