Old Bugs, New Tricks: Multi-Drug Resistant Infections
ACPE # 0004-0000-11-016-L01-P  1.0 hr
*This CE activity will be Knowledge based.
Presented by:
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Medication Assistance Services to Area Residents
ACPE # 0004-0000-11-017-L04-P  1.0 hr
*This CE activity will be Knowledge based.
Presented by:
Dennis Moore, PharmD
Old Bugs, New Tricks: Multi-Drug Resistant Infections

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Objectives

• Discuss resistance patterns for multi-drug resistant organisms
• Discuss how emerging multi-drug resistant infections are affecting healthcare.
• Review the steps needed to prevent the spread of multi-drug resistant organisms.

In the U.S. most antibiotic usage takes place in
a. The Hospital setting
b. Outpatient treatment
c. Agricultural usage
d. Water treatment

Causes of AbR

Natural Causes – the bacteria change
– Selective pressure
– Mutation
– Gene transfer

Societal Pressures – we force the bacteria to change
– Inappropriate usage
– Inadequate diagnostics/broad spectrum usage
– Hospital usage in the critically ill
– Agricultural usage (this one is decreasing rapidly)

A Quick AbR Timeline

• 1947 – PCN resistance appears. Four years after initial mass production
• 1961 – Methicillin resistant S. aureus (MRSA) – One year after methicillin was introduced.
• 1968 – U.S. soldiers in Asia ‘acquired’ PCN resistant STD’s.
• 1983 – Hospital-acquired PCN-resistant intestinal infections of E. faecium make a debut
• 1993 – 13,300 hospital patients died from AbR infections
• 1999 – Community-acquired MRSA was identified in the US
A Quick AbR Timeline

• 1997-2007 – no real ‘blockbuster’ antibiotics developed (Zyvox was the biggest drug to hit the market but still did not meet its pre-release expectations)

• 2007- present – a few ‘new’ antibiotics are being developed

• These drugs include ‘new’ classes of antibiotics and new derivatives of older antibiotics. Some of these drugs will be approved by the FDA in the next few years but the jury is still out on their true effectiveness.

Definitions

• Colonization – organism is present on a person but doesn’t cause a specific immune response or infection

• Pathogen – organism that can cause an infection

• Contaminant – organism that grew in the sample but is not the pathogen

Organisms

• Methicillin-resistant *Staphylococcus aureus* (MRSA)

• Vancomycin resistant *Enterococcus* (VRE)

• *Clostridium difficile* (Cdif)

*Staphylococcus aureus*

• Hardest non-spore forming bacteria

• Major human pathogen
  – Pneumonia
  – Skin infections
  – Sepsis

• Most humans are colonized

• Can contaminate clothes and linens
  – transfer by colonized hands or inanimate environment

MRSA

• Hospital-acquired MRSA (HA-MRSA)
  – Pneumonia
  – Bloodstream
  – UTI’s
  – Surgical – site infections

• Community-acquired MRSA (CA-MRSA)
  – Skin

Treatment MRSA

• Vancomycin

• Linezolid

• Daptomycin

• Tigecycline

• Quinupristin/dalfopristin

• Ceftaroline
Treatment CA-MRSA

- Sulfamethoxazole/trimethoprim
- Doxycycline
- Clindamycin
- Plus Rifampin

Enterococcus

- Not as virulent as *S. aureus*
- Survive under harsh conditions
- Major habitat is GI tract of humans
- Ability to cause infection – superinfections
- Usually people with infections are colonized with the organism
- VRE

Enterococcus

- Infections
  - UTI’s
  - Bloodstream
  - Endocarditis
  - Intra-abdominal

Treatment (VRE)

- Linezolid
- Quinupristin/dalfopristin

C. diff.

- Spore forming and toxic producing bacteria
- Normal gut flora
  - 20% hospitalized patients
- Causes antibiotic associated diarrhea
- Main transmission is person-to-person
  - Wash Hands!- no alcohol-based hand antiseptics

Treatment

- Metronidazole oral or IV
- Vancomycin oral only
A Bad Moon Rising

Microbes that are becoming increasingly resistant to drugs
- Food borne bacteria such as *E. coli*, *Salmonella*, and *Campylobacter*.
- PCN – resistant Streptococci
- PCN – resistant Staphylococci
- STD’s
- TB
- HIV

Big Picture

Strategies to prevent AbR
1. Prevent infection – wash your hands
2. Seek treatment of infections early and effectively
3. Use antibiotics wisely
4. Prevent transmission – stay home when you are febrile.

Clinical Measures

- Practice antibiotic control/stewardship
- Use local data
- Treat infection not contamination
- Treat infection not colonization
- Stop antibiotic treatment as soon as clinically possible

Conclusion

- Personally - be wise in the usage of antibiotics
- Clinically - be selective and specific in the usage of antibiotics
- Use common sense
  - Wash your hands!!
  - Follow protocols
  - Learn to hate long term usage of broad spectrum antibiotics
  - Ask questions about diagnostics and usage

References


Thank you
Questions
MEDICATION ASSISTANCE PROGRAM

NORTH CENTRAL AREA HEALTH EDUCATION CENTER
Dennis F. Moore, Pharm.D.

Educational Objectives

• Discuss Availability of MAP Services through NC-AHEC
• Provide Contact information to participants
• Discuss methods of improvement in services

AHEC BOUNDARIES

• Established new AHEC in North Central Arkansas in 2007

AHEC-NC Health Rankings

2011 AR County Health Rankings

Health Needs of Population

• Baxter County has 26% over 65, Independence is youngest with approx 18% over 65
• Higher than state averages in obesity, smoking, cancer, cardiovascular illness
• The 15 cents of the health care dollar that goes to medications determines—many times—how the other 85 cents is used.
AHEC Mission

- To improve the supply and distribution of care professionals in Arkansas, with an emphasis on primary care, through community/academic educational partnerships, to increase quality care for all Arkansans

Medication Assistance Programs

- Miscellaneous programs—usually industry sponsored—that provide prescription medications/supplies for those unable to afford such products
- Developed by companies based on philanthropy, political or public relations purposes.
- Variable as to guidelines and requirements
- Nearly impossible to navigate unless staff time is devoted to process

General Criteria for Program Participation

- Not eligible for benefits through other public/private program
- Based on total household income—most at 200% of FPL
- Some for Medicare Part-D, based on % of annual income, some for “donut hole”
- Some “case-by-case” due to financial/medical hardships

Patients Generally Excluded

- Those with prescription drug insurance coverage
- Those with household incomes over 200% of FPL
- Those with other assets (stocks/bonds/cd’s)
- Those unwilling to cooperate with written documentation requirements

Drugs We Try to Avoid

- Opioid agonist
- Some psychotherapeutic agents—however MD’s are sometimes unwilling to write for 90 day supplies that some companies demand

Mechanism of Distribution

- Provider’s office
- Patient’s home
- Some will allow either
- Some provide the card to deliver to you—the pharmacist—to obtain medication
- We never accept medications in our facility
Who to Contact?

- Searcy, Van Buren, Cleburne, Stone, and Independence—Tina Venteicher, 870-251-7126—office in Mountain View and Batesville

Discussion

- How could we help you and your patients?