Option for Treatment of Patients Who Inject Drugs and Have a Bacterial Infection

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Objectives

- Review options for treatment of patients who use IV drugs and need IV antibiotics for infection
- Example of collaboration with community resources to extend effective treatment
- Review outcomes of treatment for infections

Causes of Infections

- Unsterile needle use, reusing needles
- Unsterile diluent, most likely tap water
- Improper cleaning of injection site, licking site
- Sharing needles/syringes
- Licking needles before injecting
  - Habit
  - To test the purity of the drug
- Impurities of substances used to cut the drug
- Crushing oral opioids and injecting
- "booting"-repeatedly flushing and pulling back during injection
- Gordon, R. J., Lowy, F. D. (2005)

Bacterial Infection Risks in Addiction

- Acute infections from IVDA:
  - Estimated 60% of hospital admissions
  - 5%-15% are for infective endocarditis (Wilson et al. 2002)
- Infective endocarditis
  - 1.5-3.3 cases per 1000 injection-drug users/year (Wilson et al. 2002)
- Infective endocarditis in IVDA in Spain
  - 2%-5%/year
  - 5% to 20% of hospital admissions
  - 5% to 10% of overall death rate (Miró et al. 2002)
- Skin infection last year-29%-32%
- Lifetime history of past skin infections-55%-70% (Binswanger, Kral et al. 2000; Phillips & Stein 2010)

Common Sites of Infections

- Soft tissue infections
  - Abscesses
  - Necrotizing fascitis
- Skeletal
  - Osteomyelitis (Allison, Holtom, et al. 2010)
    - Lower extremity-66%
    - Upper extremity -26%
    - Spine-4%
    - Pelvis-4%
  - Diskitis
  - Septic arthritis- usually knee
- Heart: endocarditis
  - Tricuspid valve: 50%
  - Mitral valve
  - Aortic valve
  - Combined mitral and aortic valve
  - Pulmonic valve (rare)

Common Sites of Infections (cont.)

- Muscles
  - ileopsoas muscle abscesses
- CNS
  - Epidural abscesses
  - Brain abscesses (most likely from septic emboli from infective endocarditis)
- Pulmonary
  - Septic emboli
  - Pneumonia
  - Emphysema (from filler agents such as talc)
- Bacteremia
- Septic emboli
- Septic thrombus

Causative organisms

- Staphylococcus aureus-most prevalent (including MRSA)
- Streptococcal species- groups A, C and G-next most prevalent
- Pseudomonal aeruginosa
- Other gram-negative bacteria (E. coli, enterobacter, klebsiella, proteus, serratia)
- From saliva contamination: Actinomyces odontolytica, Veillonella, species and Prevotella melaninogenica

- Mertz, Wolbers, et al. (2008).
- Oh, S., Havlen, P. R., Hussain, N. (2005).
- Gordon, R., Lowy, F. (2005).

Treatment Recommendations

- IV antibiotics long-term determined by Infectious Diseases
  - Usually 4-6 weeks depending on the specific type of bacterial infection
- PICC: peripherally inserted central catheter

Review of Literature

- Ho, Archeleta, et al (2010) used security seals over PICCs and infusers. Could detect if seals were broken.
- Requirements:
  - Adequate housing
  - Reliable guardian
  - Signing of a contract for compliance with:
    - Daily visits for outpatient clinic visits for treatment
    - Not access PICC line for IV drug use
    - Would not take any other drugs not prescribed by hospital
- Zero tolerance policy to perceived PICC line abuse
- Formal drug counseling at start and as needed

(a) Security seals over PICCs and infusers; intact security seals (top left), perforated seals (bottom left); seals over infuser (right).

Ho J et al. J. Antimicrob. Chemother. 2010;65:2641-2644

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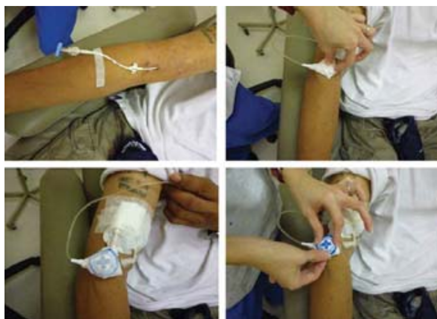

Disposition of patients who are IV drug abusers and need long-term IV antibiotics?

- Discharge to home with IV antibiotics
  - safety risk
- Discharge to home with oral antibiotics
  - ineffective
- Keep in the hospital
  - Expensive
  - Behavioral issues with patients
    - Want to go for walks on the grounds of the hospital
    - Potential for getting drugs from others

History of Our Program

- Physician in hospital came up with the idea and enlisted the help of SW Director who developed the plan with SW Dept. in 2005
- Goal: **providing a safe environment** for patients who use drugs IV
- Partnered with Rubicon (part of the Community Service Board), a residential drug treatment facility with funds from Federal Block Grants

Challenges

- Change the culture of physicians
  - Convince them either Rubicon, if recommended by Substance Abuse Consult Service, or oral antibiotics which would be inadequate treatment
- Education for discharge planners (SW, Care Coordinators, RN infusion specialist)
- Education of nursing staff at Rubicon in giving IV antibiotics and ongoing annual education
  - By Home Infusion Nurse and Manager from Critical Care Services

Challenges (continued)

- Family Care Home Health for weekly PICC dressing changes, weekly lab draws, weekly wound care and escorts for outpatient appointments
- Initially given choice of going to Rubicon or Skilled Nursing Facility
  - Continually ran into problem at SNF
    - Visitors bringing drugs
    - Behavioral problems
- This choice was eliminated quickly

Criteria for Treatment at Rubicon

- Recent use of IV drugs (within the past year)
- Not currently involved in a treatment program, AA or NA
- Unstable living environment
- Living in a drug infested area of the city
- Cannot be on methadone since Rubicon is not a provider for methadone maintenance (except pregnancy)
- Patients must be independent with functioning but can use assistive devices (may require a PT/OT eval)
- Patient Care Agreement signed by the patient

Process of Admission to Rubicon

- Require IV antibiotics
- History of recent substance abuse
- SACS consult recommendations
- Patient notified
- Patient agrees
- Patient Care Agreement signed
- Fax PCA to Rubicon

Process of Admission to Rubicon (continued)

- Get meds filled and couriered to Rubicon
- Set up transportation to have patient there by 2 PM
- Notify floor RN of plan re: meds and transportation
- Communicate with Care Coordinator or Home Infusion RN

Cost of Program

- General hospital, semi-private room: $835/day
- Rubicon: $250/day room only
  - Medications, tests, etc. not included in cost
- **Cost savings of $585/day**
- VCUMC:
  - pays daily for 1 bed whether occupied
  - has a few patients there almost all the time

Data

	Jun-Dec 2005	2006	2007	2008	2009	2010	Total	%
# Pts Tx	32	56	50	30	33	33	234	
Compl	9	30	29	24	24	10	126	54
AMA	13	14	8	1	3	9	48	21
Rt ED	0	3	0	1	1	0	5	2
Rt Hosp	10	9	13	3	3	1	39	17
No OC	0	0	0	1	2	13	16	7
Days TX	561	1041	930	680	867	432	4513	

Cost of Program (cont.)

Year	# Days	Cost
2006	1041	$260,250
2007	930	$232,500
2008	680	$170,000
2009	867	$216,750
2010	592	$148,000
Total	4110	**$1,027,500**
Savings at $585/day		**$4,808,700**

Location of Infections 2010

Location	
Soft tissue infections	6
Osteo	7
Neuro	4
Kidney	3
Heart	
Endo, fungal	1
Endo, bacterial	4
Pacer pocket infection	1
Eye (vitrectomy)	1
Muscle (psoas)	2
Bacteremia	4
Pulmonary (pneumonia)	3
Septic emboli (Renal vein, lung X2, leg and hand)	4

HCV/HIV & Non-HCV/HIV 2010

# HCV	# HIV	Both HCV/HIV	Non-HCV/HIV
7	9	2	15

Drug of Choice
IV/other routes 2010

Cocaine IV	Cocaine other	Heroin IV	Heroin other	Both Heroin & Cocaine
2	15	22	2	2

Outcome 2010

- Completed: 23
- AMA: 6 (one returned after 2 days and completed)
- PICC line pulled: 6 before AMA
- Return to hospital: 1
- Deceased: 1

Conclusion

- Successful therapy of injection drug abusers requires a team approach including internist, and consultants for specialty areas, infectious diseases, substance abuse counselors, care coordination, home infusion and working with community resources.

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