A BRIEF LOOK AT SOME LABORATORY ACQUIRED INFECTIONS

Heather Sheeley
Former Co-chair International Biosafety Working Group/IFBA
Past President European Biosafety Association
Past Chair Institute of Safety in Technology and Research
Biosafety Programme Lead UK Health Protection Agency

ABSA Miami October 2009
OVERVIEW

- New material
- Cases that may or not have been
- Lessons to learn
- Disclaimer
Study

- Laboratory exposures review
- Six years of data from primary clinical, clinical research, academia and research laboratories
- Statistical data on staff at risk, correlation with number of samples and types of procedures, staff grades and training
- Common areas
- Interventions
BACKGROUND

UK Biological agents (COSHH) and Reporting of Diseases and dangerous Occurrences Regulations (RIDDOR)

- Incidents were they has potentially been exposure to a biological agent likely to cause severe disease.
- Acute illness
- Bites and needle sticks
- Listed diseases
- When medical treatment has been given
KNOW YOUR ORGANISM
Neisseria Meningitidis - Group B
Maltose Negative

- G-Urinary urine specimen
- Unusual
- Discrimination from gonorrhoeae and cinerea

Not identified until after handling on bench
Airborne risk

Antibiotics given
No adverse affects
Corynebacterium diphtheriae LAI

- Seconded to another lab
- Unlearned technique/adequate training
- Molecular study
- Understanding of aerosol generation

Taking loop of frozen blood glycerol containing live culture.
On bench

Difference of risk assessment for research vs. diagnostic
Adequacy of training and supervision
Nature of secondment
Competency
Bacillus Anthracis - Needlestick

- Syringe containing anthrax inoculum passed between two team members. Grazed hand blood drawn but glove intact.

<table>
<thead>
<tr>
<th>PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccinated</td>
</tr>
<tr>
<td>Immediately reported</td>
</tr>
<tr>
<td>Precautionary antibiotics given</td>
</tr>
</tbody>
</table>

- Awareness of correct use of syringes
- Adequate PPE
- Vaccination
- Knowledge of need to report
KNOW YOUR EQUIPMENT
Two cases of use of biosafety cabinets

- Lights on but this did not run the fans
- Fans on but transport plate still in place several months after installed.

Over-reliance on others to check BSC
Poor understanding of checks and meaning of indicators

Proper installation
Training of installers and users
Management issues around responsibilities
NEISSERIA MENINGITIDIS - LAI

- Admitted to hospital with meningococcal sepsis. Confirmed Group B
- Worked in lab with neisseria spp.s

Worked on open bench when inoculating API strip and sub-cultured blood culture from directly vented bottle

Pre existing condition
Staffing cover
Venting arrangement had altered due to supply issues
MYCO BACTERIUM TUBERCULOSIS - EXPOSURES

- Sub-culturing when wooden swab snapped and landed outside biosafety cabinet
- Two incidents of discarded cultures being incorrectly disposed of 1) outside 2) broken
- Omission to perform “kill” step of assay

Risk assessment on swab type
Knowledge of procedures following incident including fumigation and OH access.
Thin walled bottles received from overseas
Waste procedures inadequately implemented
Checks on following procedure and management of work pressures
KNOW THE DISEASE AND SYMPTOMS
Graduate in chemistry
Training/competence

Worked on bench with a number of strains of salmonella
No gloves

Fragmented lab environment
Lighting and bench colour
Pipetting technique
Glove use
Competency and supervision
Two cases of staff at different sites off work with diarrhoea and cramps for more than 9 days

Both attributed this to eating in local restaurants
Both had been in and handled specimens with an enterics lab just prior to being ill.
Strain found to nearly identical to patient strains handle in the incubation period

No evidence of poor hygiene
Relaxed attitude to work within enteric area
Did not recognise symptoms nor attend GP
MRSA - LAI

- General bench diagnostic procedures

Developed infected hand that was unresponsive to treatment
General neuralgia

Individual had splits in the nail bed “quicks” (hyponychium)
Laboratory tradition not to wear gloves
Poor hygiene practices
INCIDENTS THAT NEVER WERE!
RELEASE OF MYCOBACTERIUM TUBERCULOSIS

- Chemostat tap clip became undone and a volume of culture was released

Chemostat enclosed in Class III safety cabinet with bund
Vented via double hepa filter, tested and working correctly

No exposure no release outside validated containment
Not treatment no risk to staff or environment
BSC contained means to deal with spillage.
Blood specimen
Incubated at 25 and 37 degrees
Spotted as having formed mycelium at 25 hence pathogen removed directly to BSL3
Thermal dimorph
Patient had been in bat caves overseas
LESSONS

- Training and supervision
- Don’t assume
- Understand equipment and its use
- Know and reinforce disease characteristics
- Understand aerosol production
- Have and rehearse response for adverse incidents
- Accommodation can prevent good practice
Hey, are you thinking what I'm thinking?

Thank you