Chapter 7

CASE STUDY 7.1 An outbreak of S. aureus

- What samples would have been taken to diagnose the infection?

Swabs of skin lesions.

- What culture media would you have used?

Blood agar plus aztreonam or a chromogenic medium for *S.aureus*.

- Why do you think they will have needed mupirocin treatment—what does this antibiotic do?

Mupirocin will kill the organism in the nose so as to stop the transmission of the organism in patients who were colonised.

- What antibiotic therapy would have been initiated to treat the skin infection—consider those children who may have allergies to some types of antibiotic?

Methicillin or erythromycin in patients who were allergic to penicillin.

- What agencies would need to have been informed?

Health Protection teams as it was an outbreak in the community.

- How would the reference laboratory detect that the causative strain of *S. aureus* produced Panton–Valentine leukocidin?

PCR to detect the gene coding for PVL production.

CASE STUDY 7.2 Toxic shock syndrome

- What samples would have been taken to diagnose the condition?

HVS swabs to grow *S.aurues.*

- How would these samples have been processed?

Aztreonam blood agar or *S.aureus* chromogenic agar.

- Upon isolation of a possible pathogen why would the isolates have been sent to a reference laboratory?

For molecular analysis to determine the toxin genes associated with the infecting organism.

Case Study 7.3 Progressive cognitive disease

- Can you suggest any infectious causes for these symptoms?

Could be a range of neurological causes but an infectious cause to consider would be syphilis.

- At this point would you suggest any samples are taken or investigations to be performed?

Blood samples for syphilis serology. Consider CSF for culture, virology and syphilis.

- What tests would have been requested on these samples and why?

Syphilis serology and bacterial/viral causes of necrotic lesions. Consider HIV. CRP as an indication of inflammatory markers and WBC counts. Establish general condition through biochemistry and haematology blood samples.

- What other clinical investigations would have been performed on this patient?

Full neurological scan and assessment. Blood cultures in case the patient was septic from infection in the necrotic lesions of the leg.

- What would you consider the diagnosis to be and how would you proceed to confirm?

Probable syphilis – perform VDRL and TPHA.

- How would this have been initially analyzed in the laboratory and how would it have been processed considering the patient history presented above?

CSF sample set up for microscopy and culture. Sent for treponema PCR, VDRL and TPHA.

- What would you determine from the CSF analysis and what further investigations would you perform?

Possible viral cause as lack of WBC in CSF possible neurological syphilis. Sent for treponema PCR, VDRL and TPHA.

- Based on the above results what is your diagnosis and what treatment regime would you suggest?

Tertiary syphilis – treat with penicillin.

- What follow-up investigations would you suggest for this patient?

Follow-up bloods and CSF for treponema PCR. Engage with neurological consultants for future management of the patient.

Case Study 7.4 High level resistance and possible consequences to public health

- What other questions would you ask the patient?

Sexual history, partners, use of protection, foreign travel.

- What could be the possible causes of these symptoms?

Most likely gonorrhoea.

- What samples would you take and how would these be processed?

Urethral swab for combined CT/GC testing by molecular method. Urethral swab for culture.

- What is your diagnosis?

Infection with *N.gonorrhoeae.*

- What treatment regime would the patient be started on?

Ceftriaxone.

- Based on the clinical history would you have any concerns about the possible effectiveness of the treatment?

Drug resistant strains are far more common in SEA.

- What tests would you preform to confirm the organism as *N. gonorrhoeae*?

Oxidase, and if positive MALDI-TOF for identification. API for additional confirmation.

- What further tests would you perform on the isolate?

Set up first and second line susceptibility tests. E-test for penicillin and ceftriaxone.

- Who would you inform about these results? What would be the role of the reference laboratory in this case?

Infectious disease clinicians and Public Health Units as highly resistant strain isolated. Reference laboratory would confirm the identity and also confirm susceptibility.

- Why did Public Health teams investigate this infection—would they do this for all confirmed cases of *N. gonorrhoeae*?

Think about the consequences of such a strain becoming endemic in the UK. Contact tracing of partners would be performed. Contract tracing is an integral part of management of STD cases.

- What would have been the consequences for UK public health should this strain become more widespread?

Huge as limits therapeutic options and perhaps one day the organism may become totally drug resistant.