

9. Infectious diseases in prison

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Key points

- Infectious diseases are an important problem in prisons, interacting dynamically with other problems of prisoners such as mental illness, addiction or homelessness.
- Contextual factors such as overcrowding, limited access to water or delays in diagnosis contribute to higher transmission rates.
- Every prison health care service should have a comprehensive vaccination programme for prisoners and prison staff.

Introduction

An effective infectious disease strategy is impossible without close collaboration between health care staff and custodial staff. As elsewhere in the world, prisoners in Europe have complex health needs, which result from an amalgam of mental and physical illness, unemployment, addiction and homelessness. Infectious diseases are an important constituent of this amalgam. The different elements do not exist as separate entities but interact dynamically, as shown in the case study of the dynamics between infections and mental illness described by Rutherford (1). People with mental illness are more likely to be infected with bloodborne viruses because of risky behaviour such as homelessness, rapidly changing moods and multiple partners. Brunette notes that the treatment for hepatitis with interferon can lead to depression and that people with mental illness may be less able to cope with side-effects such as fatigue (2).

Incoming prisoners are at higher risk of HIV, viral hepatitis, STIs, TB and methicillin-resistant *Staphylococcus aureus* (3). Contextual factors inside prisons contribute to a higher risk of transmission among prisoners. Among these factors are overcrowding, delays in diagnosis and treatment, limited access to water, soap or clean laundry and lack of availability of harm reduction measures such as condoms, clean tattooing equipment or syringes (4).

This chapter reviews the most important infectious diseases apart from HIV and TB, which are discussed in other chapters.

Influenza

Ever since Quinton described, for the first time, an outbreak of influenza in Wandsworth prison (United Kingdom) in 1890 (5), many more outbreaks have been

documented. In fact, the 1918 outbreak in the prison of San Quentin (California, United States) seems to have been one of the primary foci of the 1918–1920 pandemic (6). Nevertheless, as Awofeso (6) states, outbreaks have become rather rare in recent times. Two major strategies to prevent an outbreak have been developed. The preferred strategy involves consideration of the whole prison population as a risk group and vaccination of as many prisoners as possible every year. The disadvantages of this strategy are that it is expensive (since outbreaks are rare) and that the distribution of vaccines can be complex. A recent evaluation in the United States showed that 20% of federal and state prisons and 33% of jails did not receive the necessary vaccines (7). The prison population should be vaccinated for seasonal influenza every year from October to December.

Another proposed strategy consists of quarantine, vaccination (if available) and short-term (prophylactic) treatment of cases and their close contacts (8). Mathematical modelling shows that this strategy might also work in a prison setting (6). If vaccination of the entire population is impossible, at least prisoners belonging to risk groups should be offered vaccination. Whichever model is chosen, it must be stressed that the model needs to take into account the equivalence of care issues (9).

In 2009, at a time when no vaccine was available, the H1N1 influenza epidemic also threatened the Belgian prison system. Preparations and procedures for dealing with it at national level included the following:

- organization of a direct link to the national crisis coordination centre (interior affairs);
- creation of a crisis coordination centre for the justice department and/or prison administration;
- appointment of a responsible person for all information, announcements and publications;
- securing of funding for the prevention kits (see below: local level);
- setting up of a centralized registration procedure for staff members and detainees who were ill:
 - staff returning after a bout of influenza to be placed in sections with sick prisoners;
 - directives for separating prisoners who were not yet ill, ill or had recovered in different sections;
 - centralized registration for the organization of help for the hardest hit prisons;

- issuing of directives for quarantine of diagnosed prisoners by the medical staff;
- issuing of guidelines for the use of antiviral medication and vaccines (when they became available);
- issuing of directives to limit movement inside facilities and into or out of affected units.

Measures at local level consisted of cancelling common activities and issuing prevention kits for prisons (prisoners, staff and visitors) containing:

- non-alcoholic hand disinfection dispensers;
- non-alcoholic disinfection gels in places with no access to running water;
- a stock of disposable mouth masks;
- a stock of disposable gloves and paper handkerchiefs;
- extra dustbins to collect all the disposable material;
- posters and leaflets with prevention messages (also on the intranet);
- a stock of dry foods (in cases where kitchens or suppliers can no longer function).

Measles, mumps and rubella

Measles is a highly contagious viral disease spread by droplet infection through sneezing and coughing. Initial symptoms include high fever and a runny nose, followed by a rash descending from the head and neck. Serious complications can develop, specifically in malnourished patients or in patients with diminished immunity. Laurent et al (10) showed how the immune status of migrant populations in a Swiss prison was fairly low. Targeted vaccination programmes for migrant prisoners could reduce the risks of transmission. In fact, vaccination for measles (combined with mumps and rubella) should ideally be offered to all incoming prisoners without a reliable vaccine history.

Measles, mumps and rubella vaccination should also be offered to female prisoners of childbearing age without a reliable vaccine history, to protect them against rubella.

Some authors also suggest vaccination of prisoners against varicella zoster, the virus that causes chickenpox (4). There are combined measles, mumps, rubella and varicella zoster vaccines.

Viral hepatitis

Viral hepatitis is the leading cause of cirrhosis and liver cancer, which in turn ranks as the third cause of cancer death worldwide. Within the WHO European Region, approximately 14 million people are chronically infected with HBV, and 9 million people are chronically infected with HCV (11).

Across Europe, prisoner populations are disproportionately affected. The reasons are to be

found in the lifestyles of many prisoners. Injecting drug use, tattooing and risky sexual behaviour all favour transmission of these bloodborne viruses. Another reason is the overrepresentation of migrants from endemic regions in European prisons.

With few exceptions, European countries now have universal vaccination for HBV in children. As a result, most new cases now occur among adults. Non-immune prisoners are at high risk of becoming infected and should be vaccinated. Different countries have allowed rapid or ultra-rapid vaccination schemes (for example, on days 0, 7 and 21 with a booster after 1 year) for adult prisoners, thus avoiding the risk of incomplete vaccination when a regular scheme (0, 1 and 6 months) is used.

In the absence of a vaccine for hepatitis C, treatment is the only option. Ideally, all incoming prisoners should be screened for hepatitis C and, if found positive, liver damage and the need for treatment should be evaluated. Treatment is complex and expensive. Collaboration with hepatology departments is necessary. Most existing guidelines discourage the treatment of active drug users, but recently evidence has emerged that treatment of active users could help to contain the HCV epidemic:

A recent modelling study suggests that, based on realistic treatment capacity, treating 40 per 1000 IDUs annually could result in a 70% decrease in HCV prevalence over a 10-year period. The underlying principle of this 'treatment for prevention' approach, also advocated by the HIV/AIDS research community, is that the overall viral load in the population can be reduced through effective treatment of those infected, thereby halting the cycle of transmission (11).

The transmission of hepatitis A happens through contaminated food or water or by faeco-oral contamination. Foodborne and waterborne outbreaks in prisons have been described. Patients are contagious from two to four weeks before the appearance of symptoms (pruritis, jaundice) until the disappearance of symptoms. Among other risk groups, food handlers, men who have sex with men, injecting drug users, people with mental deficiencies and patients with chronic liver disease should all be vaccinated. It is, therefore, sensible to vaccinate all non-immune incoming prisoners.

Tetanus

Tetanus is caused by *Clostridium tetani*, a bacterium that enters the body through soiled wounds. In the majority of cases, the entry place is a small wound. Puncture wounds, bite wounds, wounds that are soiled and wounds that are not treated within six hours carry a higher risk. Tetanus can also, although rarely, be transmitted through

injecting drug use (12,13). It causes focal or generalized muscular spasms. Even under the best of circumstances, the mortality from tetanus is 10–40%. Incoming prisoners should, therefore, be vaccinated unless they have proof of their immune status, notwithstanding that tetanus has become a rare disease in Europe. At the least, prisoners presenting themselves with wounds should be vaccinated immediately. A patient with a type of wound carrying a higher risk should also be treated with specific immunoglobulins.

Diphtheria

Diphtheria is caused by *Corynebacterium diphtheriae*, which is spread by sneezing or coughing by the diseased patient (droplet infection). The bacteria produce an exotoxin that is the cause of the symptoms: obstructive respiratory problems with the formation of false membranes in nose and throat. There can be systemic complications, such as heart failure or paralysis. Mortality is 5–10%. The level of immunization is below standard in many parts of the world. In 1993, a nationwide epidemic struck the Russian Federation, following the breakdown of vaccination programmes (14).

Treatment consists in immediate medical isolation and treatment (antitoxins and antibiotics) of the patient and close contacts. Antibiotic treatment renders the patient non-infectious within 24 hours.

Incoming prisoners should be vaccinated unless their immune status can be proven, using the combined diphtheria/tetanus vaccine for adults.

Sexually transmitted infections

As Tang (15) states:

There is ample evidence worldwide that sexually transmitted infection and bloodborne viral infection are more highly prevalent in prison populations than in the outside community. STI diagnosis and treatment services in prisons are therefore an essential component of any STI control programme.

Prisoners often belong to vulnerable groups in society, who have a higher risk of STI because of, for example, injecting drug use, engagement in commercial sex activities and unprotected intercourse. They also engage in high-risk sexual behaviour in prison, or can become the victim of sexual violence.

Apart from screening for HIV, HBV and HCV, voluntary screening for other STIs (chlamydia, gonorrhoea, syphilis) should be offered to all prisoners with risky behaviour.

With the advent of nucleic acid amplification tests for chlamydia and gonorrhoea, male patients show less

resistance to testing. Nevertheless, prisoners may find donating a urine sample problematic for fear of drug testing. It is the responsibility of the prison health care team to build up the necessary trust and confidentiality.

Gonorrhoea is a bacterium that infects the urethra in men and the cervix, uterus and fallopian tubes in women. Although a silent (symptomless) infection is possible, many men will experience burning pain while urinating. The infection produces a white to green discharge. In women, symptoms are often less specific: burning sensations while urinating, blood loss and vaginal discharge. In both men and women, rectal infection can create painful defecation, rectal discharge, bleeding and anal itching.

Untreated, gonorrhoea can cause infertility through pelvic inflammatory disease in women and through epididymitis in men. Treatment consists of antibiotics. More and more strains of *Neisseria gonorrhoea* are resistant to ciprofloxacin, penicillin or tetracyclines.

Chlamydia trachomatis often presents without symptoms. In men, it can cause urethritis, epididymitis and proctitis. In women it causes cervicitis (often with contact bleeding), which can develop into pelvic inflammatory disease. Diagnosis is preferably made by nucleic acid amplification tests (urine or urethral discharge in men, vaginal discharge or cervix in women, rectum if anal intercourse has taken place and pharynx in case of oral sex).

Syphilis, caused by *Treponema pallidum*, evolves in several phases. The hallmark of primary syphilis is a painless wet ulcer (chancre) at the site of inoculation (genitals, anus and mouth), which disappears after three to six weeks. The secondary phase, which starts some weeks after the chancre, consists of body rashes, often on the palms of the hands and soles of the feet. It can last up to two years and be accompanied by subfebrility, fatigue, weight loss, patchy hair loss, swollen lymph nodes and muscle pains. In the third stage of late syphilis, serious and irreparable damage is done to the nervous system, the heart, the brain and other parts of the body.

As a primary screening test, treponema pallidum haemagglutination assay or enzyme immunoassay can be used. A fluorescent treponemal antibody test can then be used as confirmation. Venereal Disease Research Laboratory and rapid plasma reagin tests are used to monitor the response to antibiotic treatment. Interpretation of syphilis serology can be difficult and is best left to specialists. Syphilis is often found in people

with HIV/AIDS. A confirmed diagnosis of syphilis should, therefore, prompt HIV testing.

Notification and treatment of partners can be difficult in prison, either because of practical difficulties (if partners live in the community) or because of the taboo on sex among inmates. In the first case, collaboration with an outside agency can be a solution.

Ectoparasites

Ectoparasites such as scabies and lice are not uncommon in prisons.

Rash, pruritis and/or skin lesions are the hallmarks of scabies. In most instances, diagnosis is not too difficult. Indeed, it is often self-diagnosed. Efficient treatment is, however, only possible if there is close collaboration between medical and custodial staff. Efficient treatment requires the diagnosis and topical treatment of the index case and other cell-mates, together with access to showers and disinfection of bed linen, towels and clothes. Not infrequently, the handling of infected items in the prison laundry leads to new cases. This can be avoided by using protein-based laundry bags to collect the infected items: the bags can be put inside the washing machines without further handling of the infected clothes or linen.

Pediculosis capitis, or head lice, are caused by an insect parasite of human head hair. Apart from the hair, bed linen, clothes, combs and brushes can be infested. Treatment should, therefore, not only include topical treatment but also disinfection of the mentioned items. Prison barbers (often prisoners) should be educated on the cleaning and disinfection of their barbering equipment.

Vaccination, quarantine and personal hygiene

Table 5 gives a proposed vaccination scheme for certain infectious diseases.

In cases of highly contagious disease or a threatened epidemic, isolation for medical reasons (quarantine) can be warranted. In such cases, the following rules should apply.

Only a medical doctor can decide on the need for isolation. The beginning and end of quarantine measures are strictly medical decisions.

The duration of isolation should be limited to the strictly necessary minimum.

Medical and custodial staff will see to it that the rights of prisoners are guaranteed as far as possible (daily walk, legal assistance, contact with family).

The quarantined sections of the prison (a cell, a section or the entire prison) must be marked by biohazard signs (Fig. 2). Biohazard signs (such as posters and stickers) should always be available in the medical department. Other logograms at the entrance of the quarantined zones can show which protective measures (such as disposable mouth masks and gloves) are necessary to enter the zone.

Fig. 2. Biohazard sign



Protective clothing and dustbins for used disposables should be made available at the entrances/exits of the quarantined zones.

Table 5. Vaccination scheme for certain infectious diseases

Disease	Vaccination scheme
Seasonal influenza	All prisoners or risk groups (October–December)
Tetanus/diphtheria	All incoming prisoners without a reliable vaccination history
Measles, mumps, rubella	All incoming prisoners without a reliable vaccination history and women of childbearing age without a reliable vaccination history
Hepatitis A	All incoming non-immune prisoners
Hepatitis B	All incoming prisoners without a reliable vaccination history
Pneumococcus	Prisoners aged over 65 years and prisoners with HIV/AIDS

Finally, the following are the rules for personal hygiene.

1. All incoming prisoners should be educated about the importance of personal hygiene and should have regular access to decent toilets, toilet paper, sanitary napkins, clean water, soap and clean laundry. They should be aware of the importance of wound care and have access to wound care material if necessary.
2. Targeted efforts should be made to educate and assist prisoners who may have difficulties with personal hygiene, such as prisoners with an intellectual disability.
3. All incoming prisoners should be educated about the universal precautions against bloodborne viruses and have access to the means to protect themselves, such as sterile syringes, condoms, dental dams, personal towels and personal toothbrush or comb.
4. Prisoners and all staff must be able to recognize the biohazard sign (Fig. 2) and understand which measures need to be taken to protect themselves if necessary.

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Noncommunicable diseases
