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Tuberculosis Control in Prisons in England

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Summary

England has one of the highest rates of TB in Western Europe and significant disease burden exists within prisons. International efforts to advance the prevention and control of TB in prisons have culminated in new system-wide strategies being implemented in English prisons to identify and treat the disease. This article summarises these developments with the aims to inform those working in relevant healthcare or policy roles, and to promote best practice internationally. A review of national and international policy was conducted, and expert advisors in the field of health and justice and TB were approached through Public Health England professional networks to contribute evidence.

Key to the success of the new approach is the identification of active (symptomatic and potentially infectious) and latent (asymptomatic and non-infectious) cases of TB. Healthcare and custodial staff have important roles to play in this and in enabling effective screening, treatment and infection control. Prison staff working directly with prisoners who are unvaccinated, tuberculin-negative and aged under 35 years should receive BCG. Treatment should be managed by a multidisciplinary team which is responsible for ensuring continuity of care, an issue particularly pertinent given the high turnover of detainees in these settings.

Tuberculosis (TB): the disease and its incidence

Tuberculosis (TB) is an infection of the lungs and/or other organs, usually caused by *Mycobacterium tuberculosis* but occasionally by other mycobacterium such as *M. bovis, M. africanum* or *M. canettii*. TB is transmitted via the respiratory route, by breathing in respiratory droplets from a person with infective pulmonary TB.[1] The infection may develop into active TB, affecting organs such as the lungs, kidneys or bone; or it may remain in a latent, asymptomatic and non-infectious state.[2] TB is likely to be underdiagnosed due to the fact that it can remain in a latent and asymptomatic state, and the non-specific symptoms can be confused with other diseases.[3] Latent TB can activate and become symptomatic and/or infectious at any point: 5 per cent of cases develop in to active TB straight away, and 10 per cent may reactivate at any further point, most likely in the first two years following infection.[4] The risk of reactivation in patients with HIV co-infection rises to an annual risk of 15 per cent.[5]

England has one of the highest rates of TB in Western Europe; in 2016 there were 5,664 reported cases of TB in England, 74 per cent of which were among people born outside the UK and 11 per cent among those with at least one social risk factor such as imprisonment or homelessness.[6] TB is a particularly significant public health concern for the English Prison Estate. In 2016/17 there were 35 cases of TB notified in prisons in England, equal to a rate of around 40 cases per 100,000 persons.[7] By comparison, the rate of the TB rate in thegeneral population in England stood at 10.2 per 100,000 in 2016.[8] Globally, the incidence of TB in prison populations is estimated to be 23 times higher than that of in the general population, exacerbated by the high prevalence of HIV co-infection, which increases the risk of reactivation and subsequent spread of TB.[9]

1. Public Health England (2013) The Green Book Chapter 32: Tuberculosis. London : PHE, pp. 391-409.
2. Ibid.
3. Anders P, Jolley R, Leaman J. (2017) Rebalancing Act. London : Public Health England and The Home Office
4. Public Health England (2013) see n.1.
5. Aaron L, Saadoun D, Calatroni I, Launay O, Mémain N, Vincent V, Marchal G, Dupont B, Bouchaud O, Valeyre D, Lortholary O. 5, (2002) Tuberculosis in HIV-infected patients: a comprehensive review. In Clinical Microbiology and Infection, Vol. 10, pp. 388-398.
6. Public Health England (2017) Tuberculosis in England: 2017 Report. London : PHE.
7. Public Health England (2017) Health and Justice Annual Review 2016/17. London : PHE.
8. Public Health England (2017) see n. 6.
9. Aaron et al. (2002) see n.5; Dolan K, Wirtz AL, Moazen B, Ndeffo-mbah M, Galvani A, Kinner SA, Courtney R, McKee R, Amon JJ, Maher L, Hellard M, Beyrer C, Altice F. (2016), Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees in The Lancet, Vol. 388, pp. 1089-1102.

Risk-factors associated with TB

Social risk factors such as homelessness and drug or alcohol dependence put people at higher risk of acquiring TB, and are often over-represented amongst the prison population.[10] Over 15 per cent of prisoners surveyed in 2012 had been homeless immediately prior to custody, compared to a lifetime experience of 3.5 per cent in the general public.[11] Twice as many people in prison report harmful drinking compared to the general population whilst one hundred times as many people in prison report opiate and cocaine use compared to the general population.[12] Injecting drug behaviours brings with it the risk of HIV co-infection (as well as other blood borne infections) which can increase the risk of TB transmission.[13] Factors related to prison life itself also increase the risk of contracting TB. The close living arrangements of life in prison can easily facilitate the spread of TB between persons, and the high turnover of detainees increases the likelihood of transmission to other areas and institutions.[14] Those with TB released from prison without treatment also risk transmitting TB in their communities.[15]

The importance of addressing prisons as high-risk settings for TB is increasingly recognised in national and international guidelines. The World Health Organisation provides explicit guidance on the importance of managing TB in prisons in their key publication Prisons and Health.[16] The Collaborative Tuberculosis Strategy for England: 2015 to 2020 was published in 2015 and made specific reference to the identification and treatment of cases in prisons, demonstrating renewed political commitment to address TB in this setting.[17] The National Institute for Health and Care Excellence (NICE) provides guidance for prisons in England and Wales on the management of TB, which includes prevention, containment and treatment recommendations in NICE Guideline No. 33.[18] In January 2017, Public Health England published Tackling tuberculosis in under-served populations: a resource for TB control boards and their partners.[19] This outlined the importance of addressing TB in the criminal justice setting and recommended improved early diagnosis of TB within prisons.[20] There is also a National Partnership Agreement between the HM Prison and Probation Service, the National Health Service and Public Health England to align support and resources to address the burden of TB.[21]

Active TB identification and response

In England, all new entrants to prisons should be assessed for symptoms of active TB in order to protect the health of detainees and staff by facilitating prompt treatment.[22] This is in line with international recommendations.[23] Symptoms include:

- ❒ Cough lasting more than two weeks
- ❒ Haemoptysis (coughing up blood)
- ❒ Unexplained weight loss over the past six months
- ❒ Night sweats
- ❒ Fever
- ❒ Poor energy
- ❒ Lack of appetite

Any person with these symptoms should be isolated in a single cell or room as soon as possible to await comprehensive medical assessment. If multi drug resistant (MDR) or extremely drug resistant (XDR) TB is suspected (e.g. history of non-compliance with treatment, known residence in MDRTB high incidence country, or contact with a known MDR/XDR case), isolation in a negative pressure room in an external hospital should be considered.[24] All new entrants who report a previous TB diagnosis should have their treatment status verified (as either untreated, partially or fully treated) with medical records. Where medical records are unavailable, the local health protection team can assist in establishing treatment status. In detention settings with an on-site digital X-ray machine, all new entrants should be offered a chest X-ray to screen for active TB if they have not had a chest X-ray in the past six months.[25] As TB is an

10. Public Health England (2017) Tackling tuberculosis in under-served populations: a resource for TB control boards and their partners. London : PHE.
11. Anders et al (2017) see n.3.
12. Ibid.
13. Aaron et al. (2002) see n.5; Dolan et al (2016) see n.9.
14. World Health Organisation (2017). Tuberculosis in Prisons. World Health Organisation Tuberculosis (TB) Fact Sheets. http://www.who.int/tb/areas-of-work/population-groups/prisons-facts/en/
15. M. Dara, S. S. Chadha, N. V. Melchers, J. van den Hombergh, E. Gurbanova, H. Al-Darraji. 1, (2013) Time to act to prevent and control tuberculosis among inmates in International Journal of Tuberculosis and Lung Disease, Vol. 17, pp. 4-5.
16. M. Dara, D. Chorgoliani, P. Colombani (2014) TB prevention and control care in prisons. Prisons and Health. World Health Organisation, Geneva : WHO pp. 56-72.
17. Public Health England (2015) The Collaborative Tuberculosis Strategy for England: 2015 to 2020. London : PHE.
18. National Institute for Health and Care Excellence (2016) NG33: Tuberculosis. NICE Guidance. https://www.nice.org.uk/guidance/ng33
19. Public Health England (2017) see n.10.
20. Ibid.
21. NOMS, PHE, NHSE.(2015) National Partnership Agreement: Commissioning delivery of Healthcare in Prisons 2015 - 2016. London : NOMS, PHE, NHSE.
22. Public Health England (2017) see n.10; National Institute for Health and Care Excellence (2016) see n.18.
23. World Health Organisation (2017) see n.14; Dara et al (2014) see n.16.
24. Public Health England (2013) Management of TB in Prisons. London : PHE.
25. National Institute for Health and Care Excellence (2016) see n.18

indicator illness for HIV, testing for this should be offered to all patients diagnosed with active TB.[26]

Latent TB identification and response

Latent TB (LTBI) describes a phase of infection in which a patient with TB is not symptomatic or infective. Diagnosing and treating latent TB before it reactivates has been shown to be both cost effective and clinically effective in preventing active TB infection and subsequent risk of transmission.[27]

People diagnosed with HIV in prison or undergoing blood borne virus testing should be offered latent TB testing.[28] Detainees within, or transferred from, areas of the UK or other countries with a high incidence of TB (more than 40 cases per 100,000 people per year) should be offered interferon-gamma release assay (IGRA) testing for latent TB if they are younger than 65 years of age or in regular contact with substance misuse or other support services.[29] Plans are in place to expand this programme to cover all foreign nationals from high incidence countries in prison, regardless of contact with support services. A pathfinder pilot, led by the national PHE Health and Justice Team, is due to commence in 2018 in selected sites in the South East of England.[30]

Treatment

Drug-sensitive TB is treatable with a combination of several anti-tuberculosis drugs, usually taken for around six months.[31] If the full course is not completed, relapse or drug resistance may occur, making future treatment more challenging.[32] All new entrants to prisons should be asked if they are taking TB medication and be provided with continued treatment.[33]

Directly observed therapy (DOT) is recommended for all persons within prisons undergoing treatment for TB.[34] This is a process whereby all doses of treatment are given under supervision to ensure the right drugs are taken at the right time, for the full course of treatment, in order to improve treatment adherence and reduce the risk of drug resistance or disease recurrence. A recent systematic review demonstrated that the use of DOT resulted in significantly higher treatment completion rates in prison settings.[35]

TB treatment regimens can be complex and dependent on various factors including the patient's pre-existing medical conditions, the context in which treatment is being delivered, and the drug susceptibility of the TB organism detected.[36] Treatment regimens require careful and specialist monitoring.[37] It is therefore recommended that all patients undergoing treatment for TB in prison are referred to the local TB specialist service to ensure quality and continuity of care in and around the prison estate, and especially on release into the community where often real challenges emerge with patients 'falling off' the care pathway.[38]

Control and Prevention of Onward Transmission

All prison staff members who are unvaccinated, tuberculin-negative (a test for TB immunity) and aged less than 35 years are recommended to receive the BCG vaccination.[39] There is no data available on the protection afforded by BCG vaccine when it is given to adults aged 35 years or over, and so is not recommended for this age group.[40] There are very few studies assessing the effectiveness of BCG vaccination in adults, and more research is required to determine how effective it is at preventing cases of pulmonary TB (the more common form of TB found in adults).[41]

To prevent onward transmission of TB, isolation of infectious patients in a single cell or room is recommended, ideally in the healthcare department, until it is determined by the health protection or TB specialist team that the patient is no longer infectious.[42] It is recommended that cases should wear a surgical mask whilst infectious and

26. British HIV Association (2008) UK National Guidelines for HIV Testing. London : BHIVA
27. National Institute for Health and Care Excellence (2016) see n.18
28. National Institute for Health and Care Excellence (2016) see n.18; British HIV Association (2016) British HIV Association guidelines for the routine investigation and monitoring of adult HIV-1-positive individuals. London : BHIVA
29. National Institute for Health and Care Excellence (2017) Tuberculosis in prisons or immigration removal centres.
30. Public Health England South East (2016) Audit of TB in Prisons & IRCs . London : PHE
31. National Institute for Health and Care Excellence (2017) see n.29
32. Dara et al (2014) see n.16
33. Public Health England South East (2016) Audit of TB in Prisons & IRCs . London : PHE
34. Public Health England (2013) see n.1; National Institute for Health and Care Excellence (2017) see n.29; European Centre for Disease Prevention and Control (2017) Systematic review on the diagnosis, treatment, care and prevention of tuberculosis in prison settings.s.l. : ECDC
35. European Centre for Disease Prevention and Control (2017) see n.34
36. National Institute for Health and Care Excellence (2016) see n.18
37. Ibid
38. Public Health England (2017) see n.10; National Institute for Health and Care Excellence (2017) see n.29; Public Health England South East (2016) see n.33
39. Public Health England (2013) see n.1.
40. Public Health England (2013) see n.1
41. Public Health England (2013) see n.142 Dara et al (2014) see n.16; Public Health England (2017) Draft guidance: Tuberculosis (TB) active case finding protocol for new receptions in prisons and immigration removal centres. London : PHE; European Centre for Disease Prevention and Control (2017) see n.34
42. Dara et al (2014) see n.16; Public Health England (2017) Draft guidance: Tuberculosis (TB) active case finding protocol for new receptions in prisons and immigration removal centres. London : PHE; European Centre for Disease Prevention and Control (2017) see n.34

outside of their cell to prevent aerosols of respiratory droplets being inhaled.[43] Persons on TB treatment must therefore be placed on medical hold until no longer infectious, and only managed by staff who have been immunised against TB.[44] The local health protection team and TB service should be able to provide guidance as to infection prevention and control.

Contact tracing and screening may be warranted if there is found to be a risk of transmission from a TB case.[45] A risk assessment should be undertaken by the local health protection team to determine the extent of screening and contact tracing required.

Managing transfers to other institutions and the community

It is essential that people with TB continue their treatment when transferred between institutions or released into the community.[46] Robust processes to ensure continuity of care are particularly pertinent given the high turnover of the prison population. All prison healthcare teams should ensure that contingency, liaison and handover arrangements between institutions and community organisations are in place. This also requires other organisations, such as external healthcare or health protection agencies, to be included in planning and decision making. It is expected that all cases have a named TB case manager who can take responsibility for development and implementation of treatment continuity plans.[47] If the detainee is to be released, case managers should ensure that adequate accommodation and local provision of DOT is available to maximise the chance of treatment adherence.

Challenges

In order to identify and treat cases of TB in prisons successfully, prison staff need the right resources and opportunities to do so. Ongoing training is required to maintain skills and knowledge: a recent audit of twenty prisons in the South of England demonstrated significant variation in the understanding and implementation of relevant policy and practice related to the management of TB by prison healthcare teams, and low awareness of TB amongst the general prison workforce.[48] The logistics of undertaking IGRA testing to screen for latent TB is a distinct challenge; blood samples need to be delivered to labs within 16 hours of collection and cannot be refrigerated, which can sometimes be difficult for busy and isolated prison healthcare departments with little time to arrange prompt transport.[49]

Only eleven prisons in England have an onsite digital X-ray machine to screen for pulmonary TB, and patients may encounter considerable delays in having an X-ray done externally if there are limited prison staff available for escort.[50] Communication between prison healthcare teams, NHS TB services and public health teams is crucial for the effective clinical and public health management of TB in prisons. However, the need for tight security can result in restricted access to sites without express advance permission, and some prisons lack agreed working agreements with outside agencies which makes remote collaboration challenging.[51] The benefits of treating TB inside prisons to prevent onward transmission, particularly in the case of latent TB, are often realised by the wider population rather than the prison itself. It is important, therefore, that the resources used by prisons to identify and manage cases of TB are appropriately covered by national agencies.

Conclusions

TB in prison populations is a huge global health issue with implications not just for those with the disease, but also for prison staff, healthcare workers and the wider community.[52] The policies identified demonstrate the wider public health importance of addressing health protection issues within detention settings: by reducing the burden of TB in the prison estate, the health of the wider community is also protected as a result of the reduced risk of onward transmission. The effective management of TB cases can be particularly challenging given the restrictions of the prison environment and the high number of susceptible individuals. However, this environment also provides unique opportunities for identifying cases early, through screening of new arrivals who might have little prior contact with healthcare services, and ensuring adherence to treatment regimens with directly observed therapy (DOT). For this guidance to be implemented effectively, staff working in prisons need adequate training and resources (both custodial and healthcare) to facilitate them in identifying potential cases and engaging with treatment and screening processes. Having a specific TB policy and a named TB lead within the healthcare team to monitor and improve practice will provide the strategic overview and drive forward change. Prisons in England have the potential to be exemplars in the prevention and control of TB in detention settings, and can make a significant impact on the overall burden of TB for the country as a whole.

43. National Institute for Health and Care Excellence (2017) see n.29.
44. Public Health England (2017) see n.42.
45. European Centre for Disease Prevention and Control (2017) see n.34.
46. National Institute for Health and Care Excellence (2017) see n.29; Public Health England (2017) see n.42.
47. National Institute for Health and Care Excellence (2017) see n.29.
48. Public Health England South East (2016) see n.33.
49. European Centre for Disease Control (2011) Use of interferon-gamma release assays in support of TB diagnosis. Stockholm : ECDC.
50. Public Health England (2017) se n.7.
51. ibid.
52. Dolan et al (2016) see n.9.