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ORIGINAL ARTICLE

Impact of a newly opened prison on an accident and emergency department

S H Boyce, J Stevenson, I S Jamieson, S Campbell

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Objective: To determine the impact of a newly opened prison on an accident and emergency (A&E) department.

Method: A new category B prison opened in April 1999, the first privately run prison in Scotland and the third largest in population. All prisoners referred to the A&E department for treatment were identified prospectively during the first year after the opening of the prison.

Results: 99 prisoners and four members of staff attended during the one year period. Ages ranged from 18–64 years with a mean age of 29.8 years. Presentations were as a result of deliberate self harm (22%), injury after violence (18%), sports injury (15%), surgical condition (15%), medical illness (13%), accidental injury (9%), ENT problem (2%), and miscellaneous (6%). Thirty seven prisoners (35.6%) were admitted to the hospital. Further review at outpatient clinics was arranged for 15 prisoners. One prisoner died, the result of suicide by hanging. The remaining prisoners were returned to the prison for further management by the prison medical and nursing team. Twelve prisoners re-attended a total of 37 times, ranging from twice to a maximum of eight visits. Some 42.3% of attendances were during "working hours" (09.00–17.00) and 57.7% attended "out of hours" (17.00–09.00). Twenty four referrals (23.1%) were deemed inappropriate by the prison medical team on retrospective review. Sixteen of these occurred "out of hours". Forty one prisoners (39.4%) were known to have a history of injecting drug misuse. Including re-attenders, 59 presentations (56.7%) to the A&E department had a history of injecting drug misuse. Of these 41 prisoners, 11 (26.8%) were hepatitis C positive, with eight of these having a positive polymerase chain reaction test. No prisoners had HIV and only one prisoner was hepatitis B positive.

Conclusion: The opening of the prison resulted in only a slight increase in the workload of the A&E department. A significant proportion of prisoners were admitted to the hospital highlighting the practical and logistical problems of managing people restrained and in custody. Most cases can be safely referred back to the prison. Increased input is required from the prison medical team when dealing with deliberate self harm, frequent attenders, and "out of hours" referrals. All A&E staff must be aware of the increased risk of hepatitis C infection when dealing with a confined prison population.

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All accident and emergency (A&E) departments have to treat patients who are physically restrained, either in police custody or from a local prison. These patients are sent for treatment either by the police officer in charge at the local police station, the police casualty surgeon, or by the medical and nursing members of the prison healthcare team. Management of these patients present a number of problems to medical and nursing staff and may disrupt the normal routine of the department.

The opening of a new prison in April 1999 within the catchment area of Crosshouse Hospital, Kilmarnock, Scotland, gave a unique opportunity to study the impact on the A&E service of patients presenting in custody from this institution. The aim of the study was to assess and quantify the additional workload on the A&E department generated by this group of patients.

METHOD

The study took place over a period of one year starting April 1999 in cooperation with the prison healthcare team. All patients referred to the A&E department for treatment were identified prospectively on attendance. Records of all prisoners attending were collected from the departments computerised database and analysed. The following data were extracted for each prisoner: time of attendance, age, reason for attending, diagnosis, and disposal. In consultation with the prison medical staff a history of drug misuse and hepatitis status for each prisoner was obtained retrospectively.

RESULTS

Altogether 99 prisoners and four members of staff attended during the one year period. Ages ranged from 18–64 years with a mean age of 29.8 years. Presentations were as a result of deliberate self harm (22%), injury after violence (18%), sports injury (15%) (mainly from playing football), surgical condition (15%), medical illness (13%), accidental injury (9%), ENT problem (2%), and miscellaneous (6%) (fig 1).

Thirty seven prisoners (35.6%) were admitted to the hospital as an inpatient. Figure 2 illustrates the specialties involved.

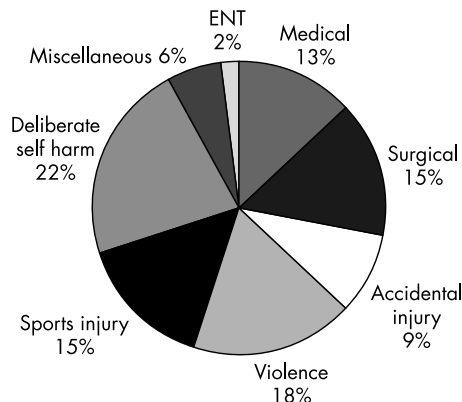


Figure 1 Aetiology of presentation.

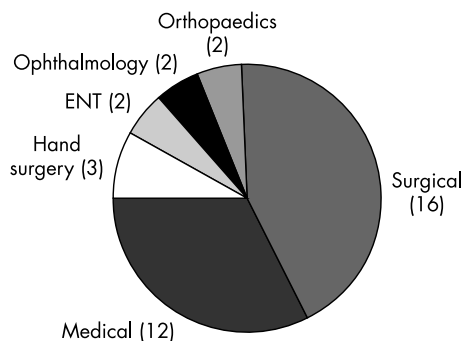


Figure 2 Number of prisoners admitted to hospital.

Table 1 Medical admissions

Clinical condition	Number of attendances
Drug overdoses	3
Diabetic ketoacidosis	2
Angina	2
Myocardial infarction	1
Jaundice (acute hepatitis C)	1
Calf deep vein thrombosis	1
Calf thrombophlebitis	1
Muscular chest pain	1

Table 2 Surgical admissions

Clinical condition	Number of attendances
Acute cholecystitis	4
Non-specific abdominal pain	3
Head injury—concussion	2
Acute pancreatitis	1
Obstructed inguinal hernia	1
Acute appendicitis	1
Abdominal stab wound	1
Gastroenteritis	1
Calf thrombophlebitis	1
Foreign body—rectum	1

The clinical conditions requiring admission to the medical and surgical units are outlined in tables 1 and 2 respectively. Further review at outpatient clinics was arranged for 15 prisoners. One prisoner died, the result of suicide by hanging. The remaining prisoners were treated and returned to the prison for further management by the prison medical and nursing team (fig 3).

Twelve prisoners re-attended a total of 37 times, ranging from twice to a maximum of eight visits by one person. Some

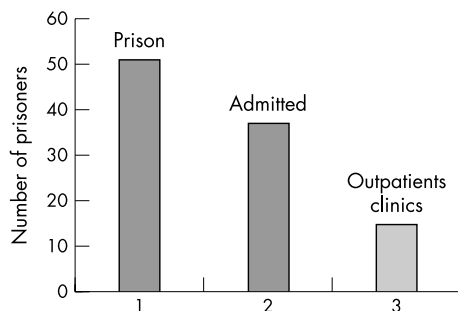


Figure 3 Management of prisoners.

42.3% of attendances were during “working hours” (09.00–17.00) and 57.7% attended “out of hours” (17.00–09.00). Twenty four referrals (23.1%) were deemed inappropriate by the prison medical team on retrospective review. Sixteen of these were during the “out of hours” period.

Forty one prisoners (39.4%) were known to have a history of injecting drug misuse. Including re-attenders, 59 presentations (56.7%) to the A&E department had a history of injecting drug misuse. Of the 41 prisoners, 11 (26.8%) were hepatitis C positive, with eight of these having a positive polymerase chain reaction test. No prisoners had HIV and only one prisoner was hepatitis B positive.

DISCUSSION

HMP Kilmarnock is a category B prison housing remand cases, temporary young offenders pending transfer to other establishments, and prisoners on short-term and long term sentences. Inmates are aged 21 years and upwards, although remand prisoners are present from 16–21 years. The prison was financed by the private sector and is managed privately within the Scottish Prison Service Estate. While there are many prisons in England managed by the private sector within the English Prison Service Estate, HMP Kilmarnock is the first such venture in Scotland, however, after a recent review of the Scottish Prison Services Estate it is unlikely to be the last.

The prison holds the third largest population of prisoners in Scotland with 550 inmates, however, this can increase to a maximum of 650 prisoners through increased cell sharing if required. The prison medical service estimate that 80% of inmates have been involved in some form of drug misuse before admission. Thirty per cent of these involved heroin and 22% are injecting drug misusers.

Medical facilities at the prison consist of a 16 bedded hospital staffed by nurses 24 hours. Doctors are present 40 hours per week with 24 hour on-call cover. At the time of the study 10 local general practitioners, also acting police casualty surgeons, provided the “on-call” service out of hours. Facilities are present with the healthcare centre for routine dental treatment and general radiography, however, radiographers must be called from the hospital to provide this service only during normal working hours. A treatment room is present for minor procedures, for example, suturing and wound management. There are also consulting rooms available for specialist consultants from the hospital to review inmates as domiciliary visits.

The concept of prison healthcare in general is the subject of current debate, further subdivided by the private versus state prison issues, and is outwith the remit of this paper.^{1–5} The population of a prison is not representative of the general population and is typically male, between the ages of 15–44 years, poorly educated, from the lower social classes. There may be a history of smoking, alcohol and drug misuse, mental disorder, and chronic disease.³ One recent study from the USA reported the disease profile of prison inmates in one state concluding that the prison population exhibited substantially higher prevalence rates of disease than those reported for the general population.⁶ Within the prison there exists a pool of chronic disease and drug misuse that can lead to significant morbidity and acute hospital presentations. In our study 37 prisoners were admitted to hospital wards, mostly medical and surgical. Many of these were with potentially life threatening conditions. This highlights a large group of prisoners that may present to A&E departments requiring immediate treatment and hospital admission.

Managing prisoners in A&E departments and hospital wards presents other problems. HMP Kilmarnock’s policy is that the prisoner must remain restrained to two prisoner officers at all times in the A&E department and throughout the course of the hospital admission period in the ward

regardless of the prisoners category. Other prisons, for example, low security open prisons, may send patients alone to hospital for treatment in other parts of the country. This means that a prisoner arriving in our A&E department will be restrained to two prison officers, even if they have committed a minor offence or are on remand. The use of restraints on prisoners in Scotland are governed by the Prison Rules Scotland Act (1984), which sets out the circumstances under which a prisoner may be restrained while undergoing medical treatment. Restraints can consist of simple handcuffs to longer "escort" chains (handcuffs attached by a length of chain to a prison officer). The presence of a restrained prisoner may alarm other patients or relatives within the hospital as they may erroneously assume that the prisoner is either violent or dangerous. The restraints can only be removed if the prisoner is unconscious, anaesthetised, being resuscitated, or for other good medical reasons. Even when the restraints are removed the prison officers must maintain a line of sight with the prisoner. Staff may be uncomfortable working with prison officers in attendance and the restraints can present a mechanical obstruction to treatment. This also raises issues regarding the prisoner's human rights and the patient confidentiality.^{7,8} However, these concerns must be balanced against the legal responsibility that the prison authorities have to carry out the lawful sentence and to ensure the safety of both hospital staff and the general public. Managing these patients is a situation that requires consultation at a local level between the hospital and prison authorities.

The opening of the prison resulted in only a small increase in the workload. In total 99 prisoners and four members of staff attended the department. Most were able to be treated and sent back to the prison for further review. The main reasons for presentation were deliberate self harm and as a result of violence within the prison. Cases of deliberate self harm and repeat attendances made up a substantial portion of the workload, particularly outwith 0900–1700 hours, when medical cover is provided for the prison by on-call staff. Most of these prisoners were well known to the prison medical service for their manipulative behaviour. The prison senior medical officer retrospectively identified 23% of these referrals as being inappropriate, and could have been managed at the prison. Two thirds of these occurred "out of hours". The "out of hours" medical service comprised of police casualty surgeons who were predominately general practitioners providing a medical service for the police. An independent audit within the prison, separate from our study, had already identified that these doctors were more likely to advise nursing staff by telephone to arrange transport to A&E rather than attend and review the patient themselves. This practice presented numerous logistical problems to the prison in terms of supplying escorts to transport the prisoner. On-call medical staff at the prison have since been changed to comprise of doctors with A&E experience and they are required to attend and review the prisoner on site for non-life threatening conditions before arranging transfer to A&E if required. Although a formal completion of the audit loop has not yet taken place within the A&E department, anecdotally it seems a significant decrease in attendance has occurred both during and outwith normal working hours.

Some 39.4% of prisoners attending were injecting drug misusers. This figure increased to 56.7% when re-attenders were taken into consideration. The prison medical staff offer voluntary inmate screening for hepatitis B (HBV), hepatitis C (HCV), and HIV on admission and throughout the duration of the sentence, giving treatment where required. Testing for all these conditions is not mandatory and can only proceed after informed patient consent. Of the injecting drug misuser prisoners 26.8% were HCV positive. Only one prisoner was hepatitis B positive and no prisoners had HIV. This issue of HCV is relevant to all healthcare workers involved in the treatment of prisoners. Unpublished data, commissioned by the Scottish

Executive, in one Scottish prison, estimated that one in five prisoners in Scottish jails were infected with HCV. This value is lower than other countries where studies have highlighted a prevalence of 30.3% (France),⁹ 37% (Australia),¹⁰ and 39.4% (USA),¹¹ in prisoners. Currently research is being carried out by medical staff at HMP Kilmarnock to determine the prevalence of HCV among their inmates.

HCV is transmitted by the parenteral route. The most common vector in this country at present is sharing needles by drug addicts. Once infected the acute phase is normally asymptomatic. About 80% of those infected will become chronic HCV carriers. Up to 90% of these will develop chronic liver disease with a further 20%–30% progressing to liver cirrhosis with the attendant risk of hepatocellular carcinoma.¹² Prevalence in Britain is estimated to be between 0.08%–0.72% of the general population.¹³ The exact incidence of HCV seroconversion after an accidental needlestick injury from an infected patient is unknown but it is estimated at up to 10%.^{14,15} Current treatments for HCV infection, which are all interferon based, have a poor overall success rate in terms of sustained viral eradication. Interferon monotherapy produces sustained viral eradication in only 10%–20% overall.^{16,17} Combination treatments with interferon and ribavirin improve sustained viral eradication response to 38%–43%.^{18,19} Newer formulations of interferon seem more promising but this remains an expensive and unpleasant treatment regimen.²⁰

Contrasting the range of values for HCV prevalence within the general community against estimates of 20% prevalence rates for prisoners, it can be calculated that there is a theoretical risk of between 28-fold to 250-fold greater chance that a prisoner may be a HCV carrier compared with a member of the general public. All healthcare staff involved in the treatment of prisoners, including the emergency services personnel, must be aware of the increased possibility of contracting HCV infection when dealing with prisoners and exert extreme vigilance in their clinical procedures.

In conclusion, the perception that the opening of the prison would dramatically increase the departmental workload proved to be unfounded with only a slight increase occurring. However, this small group of patients placed significant demands on the A&E service. The presence of a prisoner and escort tended to disrupt the normal running of the department. They were often manipulative, disruptive, time consuming, and presented "out of hours" when staffing levels were at their lowest. Practical difficulties were encountered in managing prisoners in restraints and with prison officers in close proximity the issue of medical confidentiality and the doctor/patient relationship is raised.

Most of the cases presenting were of a fairly minor nature and can be safely referred back after treatment to the prison healthcare team for further management. A large portion of injuries were traumatic in origin, mainly as a result of violence among inmates. However, in this confined population, often with a background of lower social classes or drug misuse, a significant degree of underlying medical diseases exists. A sizeable proportion of prisoners were admitted to the hospital with acute medical or surgical conditions further highlighting the practical and logistical problems of managing people that are restrained and in custody.

Increased input is required from the prison medical team when dealing with the problems of deliberate self harm in inmates, frequent attenders and the "out of hours" referrals to the department. Consultation, therefore, is required between the A&E department and the prison over "problem patients" and a management plan devised.

With the high presence of drug misusers within the penal system, all emergency personnel must be aware of the increased prevalence of HCV infection, which may be between 28-fold to 250-fold greater than the general population, when dealing with a confined prison population.

Contributors

Stephen Boyce was involved in the research, overall coordination, and writing of the paper. Iain Jamieson was involved in the research and writing of the paper. James Stevenson was involved in the research and writing of the paper. Stewart Campbell was involved in the research and writing of the paper specifically in relation to hepatitis C. Both Stephen Boyce and Iain Jamieson will act as guarantors for the paper.

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