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# Hepatitis delta is a public health concern in the community setting: The role of prison health care units in limiting the spread of infection in general population

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## SUMMARY

■ *Hepatitis D virus (HDV) is a public health concern for its severe medical consequences. The aim of this pilot study was to evaluate the prevalence of the main infectious disease between the detainees of the Veneto Region. The study consisted of a survey carried between the heads of the prison healthcare staff. The data showed that on 2,119 detainees the prevalence of hepatitis B (HBV) is the 6% and that the most relevant prevalence of HBV was revealed in the East Europe detainees (Ex USSR countries, Albania, Bosnia, Kosovo, Macedonia), being the 39% of all HBcAb positive subjects. The survey also revealed as the population less protected by HVB vaccination was that comes from East Europe. Moreover, the study indicates that hepatitis D diagnosis is not well known by clinician working inside prisons and that it should be improved through specific diagnostic and therapeutic procedures.*

*Our data indicate that the prison setting may play an important and crucial role in term of public health both in intercepting patients that need of treatment and in preventing actions able to minimize the risk of infection. In prison settings screening, linkage to care and harm reduction measures should be improved in order to protect the general population from the impact of the emerging infectious diseases, including HDV. ■*

**Keywords:** *Hepatitis D virus (HDV), Hepatitis B virus (HBV), Prison, Harm reduction.*

*Available online: 30/12/2021*

## Introduction

Hepatitis D virus (HDV) infection was identified in 1977 by Mario Rizzetto and colleagues who noted a severe hepatitis in

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individuals thought to be mono-infected with hepatitis B virus (HBV) (Niro *et al.*, 2021; Rizzetto M., 2016). Over the past 40+ years since the initial identification of HDV, chronic HDV infection has come to be known as the most severe of viral hepatitis (Sureau, Negro, 2016) which leads to higher rates of cirrhosis (Chen *et al.*, 2019) and hepatocellular carcinoma (HCC) (Kushner *et al.*, 2015), compared to HBV mono-infection (Caviglia, Rizzetto, 2020; Gilman *et al.*, 2019; Mentha *et al.*, 2019).

Today approximately 587 million people are infected with chronic HBV infection with 62-72 million chronically infected with HDV (Botelho-Souza, Vasconcelos, 2017). The prevalence rate of HDV vary widely in the world. Several studies suggest the high-risk population include individuals from endemic areas, intravenous drug users, men who have sex with men, individuals with human immunodeficiency virus (HIV) or hepatitis C (HCV) and patients with multiple sexual partners (Kushner *et al.*, 2015; Lempp *et al.*, 2016; Perez-Vargas *et al.*, 2019; Shih *et al.*, 2008). Recent reports suggest that the 10.58% of general HBV-positive individuals have co-infections with HDV, excluding the intravenous drug users (IVDUs) and practitioners of high-risk sexual behaviors (HRSBs) (Chen *et al.*, 2019). Some recent data indicate

that people who inject drugs (PWID) are commonly exposed to hepatitis B virus (HBV) and HDV (Mahale *et al.*, 2018). A study conducted in San Francisco has shown that HDV viremia is present in 35.6% of HBsAg-positive drug users (Mahale *et al.*, 2018). Epidemiological studies performed between the 1980s and 1990s have estimated the HDV prevalence among HBsAg positive patients to be 5%, equating to about 20 million people worldwide (Lempp *et al.*, 2016; Sureau, Negro, 2016). Regional prevalence of HDV infection was higher in South Europe, South Africa and Asia, with relatively lower rates in Northern Europe, South Africa and North America (Taylor *et al.*, 2013). During the more recent decades the introduction of HBV vaccination, and of effective public hygiene preventive measures have led to decreases in HDV prevalence rates in multiple regions. In Italy the HDV declined from 23% in 1987 to 14% in 1992 to 8% in 1997 (Gaeta *et al.*, 2000). However, in parallel with the decreased prevalence rates in previously endemic areas, other hot zones emerged, including South Easter Russia, Northern India, Vietnam and Albania. In the last years the strong immigration activities have prompted a new rise in HDV prevalence in some European States, following a large influx of immigrants from endemic areas, such as Romania, the ex-Soviet Union and North Africa (Rizzetto, Alavian, 2013). Today the HDV prevalence is around 0.16-0.98% among the general population and 4.5-14.6% among HBsAg-positive subjects (Chen *et al.*, 2019; Stockdale *et al.*, 2020). Mongolia has reported the highest HDV prevalence (Chen *et al.*, 2019), with a prevalence rate of 36.9% in HbsAg positive people. An elevated rate more than 10% was also reported in Moldova and Western and Middle African countries (Stockdale *et al.*, 2020).

The exposure to infected blood is the predominant route of HDV transmission. Most of HDV-infected patients are IVDUs, who had been infected upon needle-stick injury or use of contaminated syringes (Hercun *et al.*, 2020). The prevalence rates among this subgroup range from 21% (Chem *et al.*, 2017) to 36% (Mahale *et al.*, 2018), with a pooled odds ratio (OR) of 19.0 (Stockdale *et al.*, 2020). Another high-risk individuals are practitioners of high-risk sexual behaviors (HRSBs). The prevalence rate in this subgroup reaches up to 11% (Lin *et al.*, 2015), with a pooled OR of 18.7 (Stockdale *et al.*, 2020). The risk of infection is also higher among human immunodeficiency virus-positive population (pooled OR: 6.6.) and hemodialytic patients (pooled OR: 3.4) (Stockdale *et al.*, 2020). Moreover, some cultural practices, such as tattoos and piercing, are quickly becoming an appreciable route of transmission (Gheorghe *et al.*, 2015). Taken together, these data show that the global presence of HDV infection has not decreased and its probably still underestimated.

More than 10 million people are incarcerated worldwide and most of them are in severe health conditions, in promiscuities live conditions and forced to share limited spaces in a mix of cultural and ethnic background (Fazel, Baillargen, 2011). In 2007, the World Health Organization (WHO) identified communicable disease, dependency/addiction disorders, and mental health diseases as the most primary care problems in prisoners. In Germany for example, prisoners are 48 to 69 times likely to be infected with HCV than the general population, and 7 to 12 times more likely to be infected with the human immunodeficiency virus (HIV) (Opitz-Welke, 2018). Moreover there is a strong association between prison cell spatial density (as measure of overcrowding), HRSBs, drug use, and unsafe tattoos and piercing able to increase the risk of infection and communicable disease transmission among prisoners (Simpson, 2019). Our recent data are showing the Sars-CoV-2 may induce in prisons a uncontrollable spread of the infection among prisoners (Grigolin *et al.*, 2021).

The principal aim of this study was to evaluate the prevalence of infectious diseases in detainees of the Veneto Region.

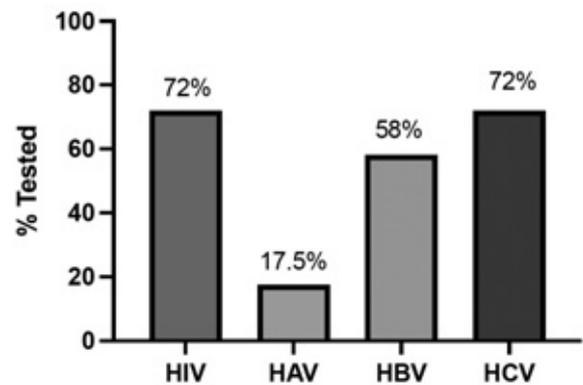
## Data collection

To evaluate the impact of infection diseases in the prison setting we performed a pilot study consisting in a survey aimed to evaluate the impact of HBV and HDV in people detained in Veneto Region. The survey involved the heads the healthcare staff of the 9 prisons existing in the Veneto Region. The survey has been conducted on 31 October 2021 and it included data referred to 2,119 detainees.

## Results

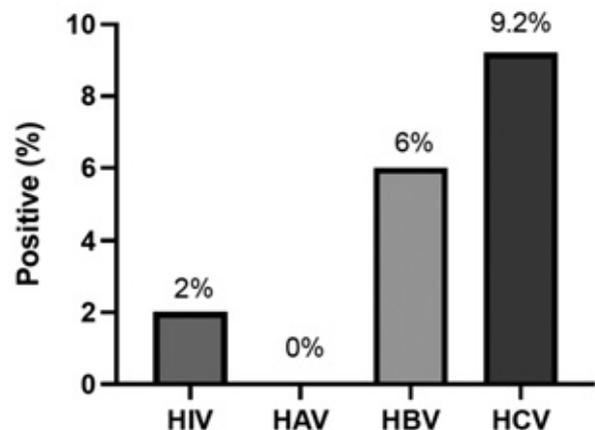
The data shows that the only 58% of detainees was tested for HBV (Fig. 1). The most elevated percentage of tests were performed for HIV and HCV (Fig. 1).

Fig. 1 - Percentage of the detainees tested



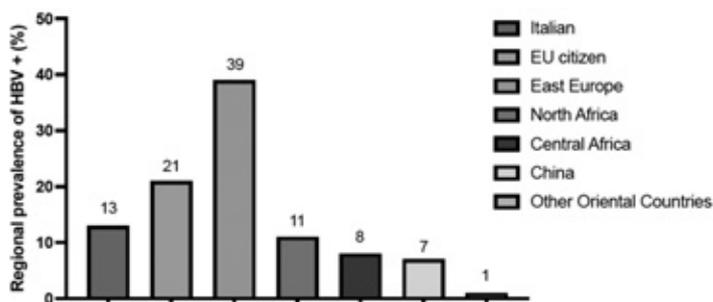
Of the patient tested the 6% resulted HBcAb positive (Fig. 2). The most elevated percentage of positive patients were revealed for HCV (Fig. 2).

Fig. 2 - Percentage of positive tested subjects



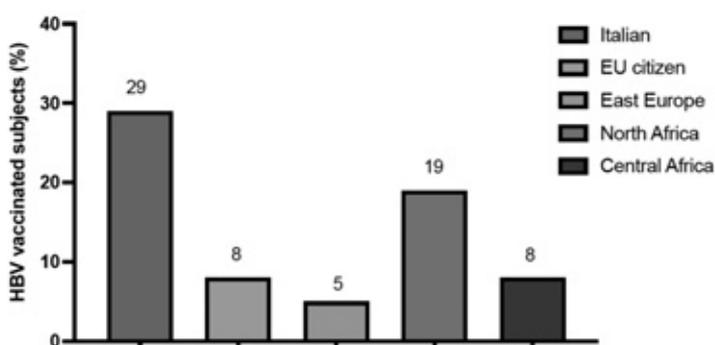
Of the HBV positive individuals 32% were drug users, confirming that drug use is an important risk factor of HBV infection. The most relevant prevalence of HBV was revealed in the East Europe detainees (Ex USSR countries, Albania, Bosnia, Kosovo, Macedonia) being the 39% of all HBcAb positive subjects (Fig. 3).

Fig. 3 - Regional prevalence of HBV + subjects



The detained vaccinated for HBV were the 69%. The most protected patients with HBV vaccine were the Italian people followed by subjects who come from North Africa (Fig. 4). The less protected were the East Europe detainees (Fig. 4).

Fig. 4 - Percentage of vaccinated subjects



The HDV test was offered to 67% of all HBV positive subjects, although the diagnosis processes and the treatment are poor known from clinicians working inside prisons.

## Discussion

In the literature there are few data on epidemiology of HDV in prisoners. The results of this pilot study suggest that HBV is tested only in about half of detainees. The study has also shown that only a few percentages of people inside prisons are protected by HBV vaccine.

These preliminary data also indicate that HDV may be a concern for prisoners for at least five reasons: first, the prevalence of HBV among prisoners is most elevated than in general population; second, inside prisons people share high-risk behaviors including IVDU, HRSBs, and unsafe use of tattoos and piercing; third, inside prison there are ethnic groups with a high prevalence of HDV that may spread the infection at people who come to non-endemic areas; fourth, the overcrowding and the promiscuities living condition inside prisons may facilitate the spread of infection; fifth, the lacking of harm reduction measures in most prisons may favor among the detainees the risk of infections and may promote both co-infections and superinfections. In other words, the prisons may be a reservoir of HDV infection and can facilitate the superinfections.

Our study demonstrates that the prisons may play a key role in terms of public health representing an active sentinel surveillance for HDV infection.

Finally, these preliminary data suggests as prisons may represent a place where is convenient to develop both prevention and treatment interventions in order to limit the spread of infections in the community.

Further studies are needed to understand the potential role of public health actions in prisons.

## Acknowledgements

The authors thank their healthcare staff for the collection of the data.

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## NOTIZIE IN BREVE

### Proposte per la valorizzazione dell'Alcologia

È stato redatto nel dicembre 2021 un importante documento da tre società scientifiche, **SIA**, **FeDerSerD** e **SITD**, in tema alcologico. Questa proficua partnership ha prodotto un documento con una premessa sui temi dell'importanza del fenomeno alcol, sulla natura complessa dei PPAC e della loro gestione, sui principi per una valorizzazione della Alcologia, sulla forma organizzativa necessaria, proponendo infine un decalogo che si riporta.

#### Decalogo

1. Collocazione della Alcologia Territoriale nei Dipartimenti delle Dipendenze autonomi.
2. Valorizzazione delle équipes alcologiche dei SerD e presenza di una Unità Operativa semplice o complessa di Alcologia che rappresenti l'hub specialistico in ogni ASL.
3. Valorizzazione, come necessario anche per le altre Dipendenze Patologiche, di un'area specialistica in Alcologia Ospedaliera, in regime di ricovero, nell'ambito dei Dipartimenti Internistici o delle Dipendenze, con la mission di favorire e promuovere l'integrazione ospedale-territorio e il trattamento delle urgenze e patologie correlate.
4. Promozione e diffusione delle collaborazioni tra territorio (Ser.D./Centri Alcologici) e ospedale (ambulatori intraospedalieri e progetti di aggancio in Pronto Soccorso). Definizione di percorsi riabilitativi specifici residenziali e semi-residenziali, sia ospedalieri che nell'ambito delle comunità terapeutiche accreditate, per pazienti con dipendenza da alcol.
5. Promozione della rete locale socio-sanitaria e sociale con le associazioni ed in particolare con i gruppi territoriali di auto-aiuto (AA, Alanon) e di comunità multifamigliare (ACAT).
6. Produzione, da parte delle Società Scientifiche di linee guida/linee di indirizzo nazionali in accordo con la legge 24/2017 e, a cascata, la definizione di linee di indirizzo regionali e PDTA o documenti di buona prassi a livello aziendale.
7. Sistematizzazione della formazione alcologica, nell'ambito di una formazione specialistica sulle Dipendenze, rivolta dei Medici di Medicina Generale e Pediatri di libera scelta, ad opera di esperti del settore e personale dei Ser.D./Centri Alcologici locali, sull'identificazione precoce dei soggetti a rischio e l'intervento breve per i soggetti con consumo dannoso di alcol.
8. Creazione di mappe della rete di servizi formali e informali socio-sanitari che ruotano attorno alle problematiche alcologiche in ogni territorio.
9. Lavoro di concertazione per la definizione, in ambito sanitario, di una disciplina professionale in Medicina delle Dipendenze, e di un insegnamento universitario specifico in Alcologia durante il corso di laurea come previsto dalla legge 125/2001 ed estensione a tutti i corsi di laurea per psicologo e professioni sanitarie.
10. Impegno per promuovere una revisione strutturale della legislazione in materia di Dipendenze e Uso Dannoso che valorizzi l'attività dei Servizi e l'approccio di sanità pubblica e riabilitativo, multidisciplinare e multi professionale, ridimensionando le istanze repressive e di controllo.

Per una lettura completa del documento, che sarà presentato pubblicamente, vedi il sito [www.federserd.it](http://www.federserd.it).

(A.L.)