Response to Hepatitis B immunisation in young adults with perinatally acquired HIV-1 infection

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Introduction:

Hepatitis B Virus (HBV) infection is a major public health problem worldwide however universal HBV immunisation is not recommended in the UK. HIV/HBV co-infection is associated with greater HBV replication, risk of transmission and higher rates of progression to cirrhosis, hepatocellular carcinoma, and death. BHIVA and CHIVA guidelines[1,2] recommend HBV immunisation of children with HIV, however it has not been routinely available in all UK paediatric clinics. A single centre audit of HBV immunisation and response in young adults with perinatally acquired HIV-1 (PaHIV) following transfer to adult care was undertaken.

TABLE 1. BHIVA and CHIVA guidelines on HBV Immunisation[1,2]

- ❖ All HIV infected children should receive HBV immunisation as adolescents.
- ❖ HBsAb titres measured at least 6 weeks after a 3-course immunisation.
- ❖ Non-responders (HBsAb <10 IU/L) may be revaccinated.
- ❖ Intermediate responders (10< HBsAb <100 IU/L) may receive a booster.
- ❖ HBsAb titres should be measured annually.

Methods:

Case note reviews of all adolescents with PaHIV were conducted. Patients with HBV infection (n=4) were excluded. Demographics, HIV data (CD4, viral load (VL), antiretroviral therapy (ART)) at time of immunisation and currently, and serology post-immunisations were recorded. HBsAb titres were classified protective (>100 IU/L), intermediate (<100 and >10IU/l), or non-responsive (<10 IU/L).

TABLE 2. Demographics of young adults with PaHIV-1 infection identified.

Category	No. (%)
Sample Size	66 (100%)
Age (median)	20
Female	37 (56%)
Ethnicity - Black African	46 (70%)
Receiving ART	48 (73%)
Received at least 1 dose of HBV immunisation	**43 (65%)**
Received at least 3 doses of HBV immunisation	**28 (42%)**
Median CD4 before immunisation (cells/μl)	520, IQR 325-710
Median Viral Load before immunisation (copies/ml)	<50, IQR 0-2944
Not immunised	**23 (35%)**
Median CD4 (cells/μl)	370, IQR 140-610
Median Viral Load (copies/ml)	105, IQR 0-8632
HBsAb titres recorded	**47 (71%)**
Current protective HBsAb titres	**13 (20%)**

Results:

43/66 (65%) received at least one dose of HBV vaccine, of whom 28 received at least 3 doses. Median CD4 count and VL at first immunisation was 520 cells/μl (IQR 325-710) and <50 copies/ml (IQR 0-2944), respectively. Of 23 unimmunised (median CD4 370, IQR 140-610), 6 had CD4 counts <200 cells/μl, 2 declined, 6 transitioned within last three months, and 9 not documented.

23/28 (89%) who completed primary HBV immunisation had HBsAb titres recorded: 9 (39%) protective, 8 (35%) intermediate and 6 (26%) non-responders. HBsAb titres after primary immunisation were significantly higher if VL<400 copies/ml at first immunisation (p=0.04). There was no significant relationship with CD4 at first immunisation or CD4 nadir (p=0.80).

FIGURE 1. Response to primary HBV immunisation.

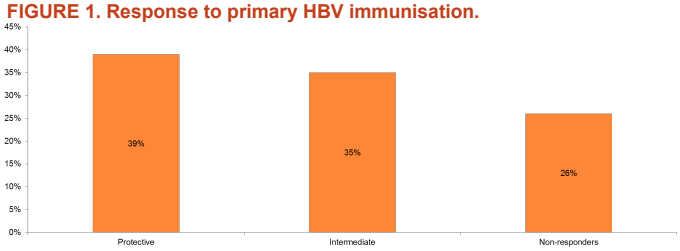
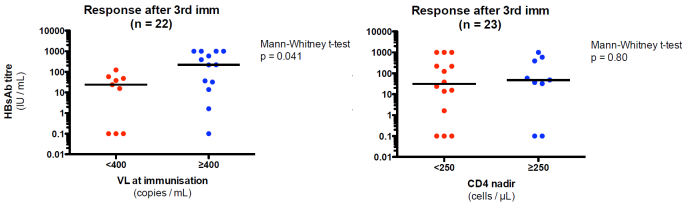
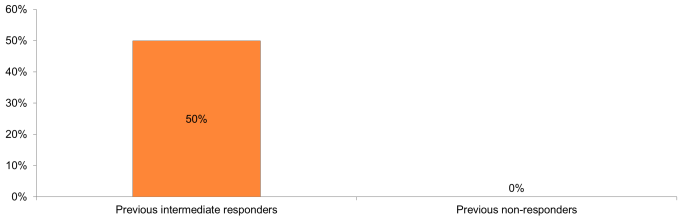


FIGURE 2. Response to primary HBV immunisation stratified by Viral Load at time of immunisation and CD4 nadir.



12 patients with poor responses were re-immunised with a booster or repeat 3-dose course. Of these, only 2/4 previous intermediate responders and 0/6 non-responders developed protective titres, and 2 were still undergoing re-immunisation.

FIGURE 3. Protective rates of re-immunisation in poor-responders.



Conclusion:

HBV immunisation is recommended in PaHIV-infected adolescents, however only a fifth of our cohort have serological protection. Earlier HBV immunisation in paediatrics, prior to HIV progression and acquiring potential risk factors (i.e. onset of sexual activity), with more aggressive monitoring and re-immunisation following suboptimal response may improve protection.

Future Directions:

- ❖Complete outstanding HBV immunisations
- ❖Monitor HBsAb titres annually
- ❖Re-immunise following suboptimal response

Acknowledgements:

900 Clinic, St Mary's Hospital. All members of the audit group.

References:

[1] Bamford A. Guidelines: Vaccination of HIV infected children. CHIVA. 2011.
[2] Geretti et al. BHIVA Guidelines for immunization of HIV-infected Adults. BHIVA. 2008.