

Observational Study

Seroprevalence of hepatitis B surface antigen in pregnant women attending antenatal clinic in Honiara Solomon Islands, 2015

Aneley Getahun, Margaret Baekalia, Nixon Panda, Alice Lee, Elliot Puiahi, Sabiha Khan, Donald Tahani, Doris Manongi

Aneley Getahun, Sabiha Khan, Department of Public Health and Primary Care, College of Medicine Nursing and Health Sciences, Fiji National University, Suva, Fiji Islands

Margaret Baekalia, Department of Health and Social Affairs, Yap State Hospital, Colonia 96943, Federated States of Micronesia

Nixon Panda, School of Nursing and Allied Health Sciences, Solomon Islands National University, Honiara, Solomon Islands

Alice Lee, Concord Repatriation General Hospital, University of Sydney, Concord NSW 2139, Australia

Elliot Puiahi, Donald Tahani, Doris Manongi, National Referral Hospital, Honiara, Solomon Islands

Author contributions: Getahun A prepared the proposal, designed the study, drafted and revised the manuscript; Panda N identified the topic and supervised the study implementation; Baekalia M, Puiahi E, Tahani D and Manongi D performed the laboratory tests; Lee A reviewed and edited the manuscript and provided technical support; Khan S design the study, analyzed and interpreted the data; all authors contributed to the write up and the revision of the manuscript.

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Correspondence to: Aneley Getahun, MD, MTCM, DTMH, Assistant Professor in Primary Care, Department of Public Health and Primary Care, College of Medicine Nursing and Health Sciences, Fiji National University, Princess Road, Tamavua, Suva, Fiji Islands. aneley.getahun@fnu.ac.fj
Telephone: +679-9789779
Fax: +679-3321107

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Abstract

AIM

To determine the seroprevalence of hepatitis B surface antigen (HBsAg) among pregnant women attending antenatal clinic in Honiara, Solomon Islands.

METHODS

This descriptive cross-sectional study was carried out in seven area health centers in Honiara. From March to June

2015, identification of eligible pregnant women in each site was conducted using systematic random sampling technique. A total of 243 pregnant women who gave written informed consent were enrolled. Standardized tool was used to record demographics, obstetric history and serology results. HBsAg and hepatitis B e antigen (HBeAg) were tested using point-of-care rapid diagnostic test. All HBsAg positive samples were verified using enzyme-linked immunosorbent assay.

RESULTS

The mean age of participants was 26 ± 6 years. The overall hepatitis HBsAg prevalence was 13.8% with higher rate (22%) reported in women between 30-34 years of age. Majority of HBsAg positive participants were Melanesians (29 out of 33). None of the pregnant women in the 15-19 years and ≥ 40 years tested positive for HBsAg. There was no statistically significant difference in HBsAg prevalence by age, ethnicity, education and residential location. The overall HBeAg seroprevalence was 36.7%. Women between 20-24 years of age had the highest rate of 54.5%. Low level of knowledge about hepatitis B vaccination was reputed. Overall, 54.6% of participants were not aware of their hepatitis B vaccination status and only 65.2% of mothers reported their child had been vaccinated.

CONCLUSION

Hepatitis B is a disease of public health importance in Solomon Islands and emphasize the need for integrated preventative interventions for its control.

Key words: Hepatitis B; Chronic hepatitis; Hepatitis B surface antigen; Hepatitis B e antigen; Seroprevalence; Pregnant women; Solomon Islands

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Core tip: The objective of this study was to determine the prevalence of chronic hepatitis B infection in a cohort of antenatal women in Honiara. The overall hepatitis HBsAg and hepatitis B e antigen (HBeAg) prevalence was 13.8% and 36.7%, respectively. Our study for the first time reported HBeAg prevalence in pregnant women. Furthermore, the study revealed low level of knowledge about hepatitis B vaccination whereby 54.6% of participants were not aware of their vaccination status. Hepatitis B is a disease of public health importance in Solomon Islands and emphasize the need for efficient delivery of integrated services for its prevention and control.

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INTRODUCTION

Hepatitis B virus (HBV) infection occurs worldwide. It is estimated that over two billion people have been infected with 360 million individuals who remain chronically infected^[1]. There are around 600000 deaths every year due to the consequences of hepatitis B^[2]. Hepatitis B is highly endemic in Africa, South-East Asia and the Pacific (excluding Japan, Australia and New Zealand), the Amazon Basin and parts of the Middle East, central Asia and some countries in Eastern Europe. In these areas, about 70% to 90% of the population are exposed to the virus during the first four decades of life, and eight to 20% of people then become chronically infected^[3,4]. It is estimated that around 45% of the world population live in areas where there are high levels of hepatitis B infection^[4].

Hepatitis B virus is a DNA virus classified within the family hepadnaviridae. It is transmitted by percutaneous and permucosal exposure to infected blood and other body fluids, mainly semen and vaginal fluid^[5]. The predominant mode of transmission varies depending on the endemicity of the disease in a given population. In areas of high endemicity, HBV is mostly acquired in early childhood from mother to child at birth or from person to person in early childhood. Exposure at an earlier age increases likelihood of progress to chronic infection. In low endemic areas, sexual transmission is the predominant route^[1,2].

Vaccination is the most cost effective way for the prevention of hepatitis B. The World Health Organization (WHO) recommends the inclusion of hepatitis B vaccine in routine immunization programs in all countries^[1]. Four doses of vaccines are given, the first one within 24 h after birth followed by three vaccines in infancy. The complete vaccine series induces protective antibody levels in more than 95% of infants, children and young adults. Protection lasts at least 20 years and is likely lifelong^[1].

The Solomon Islands is located in the southwest Pacific, stretching about 1700 km from the eastern tip of Papua New Guinea to the northern-most islands of Vanuatu. The Island chain is comprised of nine administrative provinces: Guadalcanal, Malaita, Western, Rennell Bellona, Central, Makara Ulawa, Choiseul, Isabel and Temotu. According to the 2009 census, total population is estimated at 515870 of which 80% live in rural areas^[6]. In 2013, Solomon Islands was ranked 157 out of 187 countries and territories on the Human Development Index. The country is one of the world's least developed countries and the 2013 Human Development Index was below the average for countries in the low human development group as well as below the average for countries in East Asia and the Pacific region^[7].

The current WHO model for Ante Natal Care (ANC) recommend that all pregnant women have at least four ANC assessments by a skilled attendant. WHO also encourages countries to develop national guidelines to

outline the essential minimum packages of ANC based on the local epidemiology and priorities^[8]. In Solomon Islands, ANC is based on the Manual of Obstetrics and Gynecology for Doctor, Midwives and Nurses in Solomon Islands, 2005^[9]. This recommends early ANC assessment (after 2-3 missed period) to determine expected date of delivery and identify and treat common conditions such as anemia and syphilis. The first ANC visit includes thorough history taking, physical examination, administering first dose of tetanus toxin, and bloods for hemoglobin, malaria and syphilis and urine for glucose and protein. Antenatal screening for hepatitis B is not part of the routine care.

Hepatitis B infection is hyper endemic in Solomon Islands. A large study conducted in Honiara central hospital in 1994 reported overall Hepatitis B surface antigen (HBsAg) prevalence of 19.6% which ranged from 14.6% in females to 23.4% in males^[10]. Surveillance reports and prevalence studies in population sub-groups such as pregnant women and blood donors also reported high level of chronic infection, with 14.5%-16% in pregnant women and 25% in blood donors^[11,12]. HBV C3 and D4 are the two prevalent subgenotypes in Solomon Islands and in the Pacific region^[13-16], Utsumi *et al*^[13], further reported genotype to be specific with ethnicity where genotype was C were predominant in Melanesians while genotype was D was common among Micronesians. The prevalence of hepatitis B e antigen (HBeAg) was higher among carrier of HBV subtype C compared to carriers of subtype B however it was not statistically significant. In this study there was no statistically significant difference between carriers of the two genotypes in terms of sex, liver function test (AST, serum albumin and total bilirubin) and anti-HBe seroprevalence. Previous study in Solomon Islands reported significantly higher prevalence of HBeAg among carriers of genotype C which could be associated with severe hepatic inflammation and complications^[14]. However, these studies were not designed to further evaluate the relationship between genotype and clinical progression as they were cross-sectional prevalence studies.

There is paucity of information on the prevalence of complications of HBV infection such as cirrhosis and primary hepatocellular carcinoma in Solomon Islands. Historically, the island reported a high incidence of liver cancer among males^[17]. According to the 2014 WHO report, liver cancer was the single most common cause of cancer in males^[18]. Mortality from HBV related complications in Solomon Island remains unknown. Hepatocellular carcinoma is common in neighboring Melanesian islands of Fiji^[19] and Papua New Guinea^[20].

The clinical course of chronic HBV infection generally does not change during pregnancy and chronic infection is not implicated in increased maternal morbidity or mortality^[21,22]. Most pregnant women with chronic HBV infection are asymptomatic and often detected during routine ANC screening. Pregnancy related complications and perinatal outcomes of chronic HBV are not well elucidated. Some studies reported gestational diabetic,

antepartum hemorrhage, preterm labour and lower Apgar score to be associated with chronic infection^[23,24]. Recent large scale studies from the United States and China revealed no association between maternal HBV infection and the risk of fetal growth retardation, pregnancy induced hypertension or preeclampsia^[24,25]. In Solomon Islands, the impact of chronic HBV infection on pregnancy outcomes has not been investigated.

Hepatitis B vaccine was introduced in the national immunization program in 1990-1991 and is recommended for infants at birth, 6, 10 and 14 wk of age^[26]. In 2009, the coverage of hepatitis B vaccine was 45% at birth and 81% for ≥ 3 vaccines^[27].

Ongoing transmission at birth and in early childhood is likely to continue to contribute to the significant burden of disease. This early exposure in life increases risk of chronic infection and its complications of liver cirrhosis and its sequelae, liver cancer and early death. There are no recent seroprevalence studies to document the current burden of disease. Therefore, this study aims to contribute to a clearer understanding of the current status of chronic infection in a cohort of antenatal women in Honiara, Solomon Islands.

MATERIALS AND METHODS

A descriptive, cross-sectional study was carried out in seven area health centers (Kukum, Mataniko, Rove, Vura, Mbokonavera, White River and Mbokona) providing ANC in the catchment areas of Honiara City Council. Ethical clearance was obtained from the College Research and Ethics Committee of Fiji National University and the National Health Research and Ethics Committee of Ministry of Health and Medical Services, Solomon Islands (HRC14/28).

All pregnant women who presented for the first antenatal visit were eligible for the inclusion. Using the one sample population proportion formula, the sample size required was estimated as 239 (based on 16% prevalence of HBV among pregnant women^[12], 95%CI, 5% margin error, and 15% non-respondent). Enrolment of eligible pregnant women in each area health center was conducted proportionally based on the monthly average of first ANC bookers using systematic random sampling technique. Potential study participants were invited to participate and those that gave written consent were enrolled. A total of 243 pregnant women were enrolled between March to June 2015. Information was collected using standardized proforma data collection tool which included demographics (age, ethnicity, residential location, education level and occupation), obstetric and medical history as well as HBsAg and HBeAg serology results.

One milliliter of blood that was collected for routine ANC testing was aliquoted and stored at -4°C in the national referral hospital laboratory. The specimens were thawed back to room temperature for testing according to the manufacturer's instructions^[28]. All samples were tested for HBsAg with Standard Diagnostics Bioline,

the HBsAg testing kit (30 Tests/kit, Cat. No. 01FK10W, Standard Diagnostics, Inc, South Korea). This is a point of care qualitative immunochromatography testing strip method for the detection of HBsAg. Further testing for HBsAg was performed on all positive sera and 5% of randomly selected nonreactive samples using Murex HBs version 3 enzyme linked immunosorbent assay (ELISA) - horseradish peroxidase conjugated kit which have a specificity of 99.97% and sensitivity of 100% respectively (DiaSorin, S.p.A. United Kingdom branch). Duplicate samples including positive and negative controls were included and the procedure was carried out in accordance to the manufacturer's instructions^[29] with the washing step done manually. Samples that were positive on both rapid test kits and the ELISA were considered HBsAg positive. From the 33 positive samples for HBsAg, 30 samples were analyzed for HBeAg using the ABON HBV combo test kit (ABON Biopharm, Hangzhou Co., Ltd). The remaining 3 samples were insufficient for further testing. The testing procedure and interpretation was carried out according to the manufacturer's instructions. Positive results were indicated by two red bands; one in the test region and other in the control region. Negative results were indicated by one red band on the control region.

The data was entered into Microsoft Excel spreadsheet and analyzed using Statistical Package for the Social Sciences software version 22. A descriptive analysis was used to determine the demographic, obstetric and medical profile of study participants. The overall HBsAg and HBeAg prevalence was calculated as well as determination by age group, ethnicity and location of residence. Results are presented as proportion, means with standard deviation. χ^2 test and Fishers' exact tests were used to compare the proportions between hepatitis B seropositive vs sero-negative and demographic variables. Results were considered statistically significant at $P < 0.05$.

RESULTS

A total of 243 pregnant women attending their first antenatal visit were enrolled in the study. Three pregnant women with incomplete information were subsequently excluded from analysis. The data from remaining 240 were used for analysis. The mean age of participants was 26 ± 6 years (range 16 to 45). Majority of participants were Melanesians (91%), Polynesians and Micronesians represented 5.4% and 3.3% respectively. Most pregnant women (62.1%) achieved secondary or tertiary level education, with 7.9% reporting no education. Majority of the pregnant women who took part in the study were unemployed (58.7%). Nearly half of the study participants (46%) were peri-urban dwellers (Table 1).

The average presentation for first ANC visit was in the 6 mo of pregnancy. Most women presented for the first time in their second trimester (58.2%). Majority of women were not aware of their hepatitis B vaccination status (54.6%), with only 4.6% reporting prior vac-

cination. The median number of children was 1 per participant, with most had at least one child (58.3%). Women with children under the age of 5 years (47.9%) were asked about the hepatitis B vaccination of their child/children. Of these, 65.2% of mothers said their child/children had been vaccinated, 27% were uncertain and the remaining 7.8% not having received hepatitis B vaccine.

A total of 33 sera tested positive for HBsAg, with a sero-prevalence of HBsAg among study participants of 13.8%. Highest rate of hepatitis B infection was seen in participants between the ages of 30-34 year (22%). None of the pregnant women in the 15-19 years ($n = 33$) and ≥ 40 years ($n = 2$) tested positive for HBsAg. Majority of HBsAg positive participants were Melanesian (29 out for 33). In this study the highest rates of sero-prevalence were reported among Polynesians (23.1%) followed by Melanesians (13.2%). No statistically significant difference in HBsAg prevalence by age group, ethnicity, education level and residential location is seen (Table 2). A total of 44 samples (33 positive and 11 representing 5% of the negative results) were tested with Murex HBs version 3 ELISA for quality assurance. There was 100% concordance in results.

Of the 33 HBsAg positive pregnant women, 30 were tested for HBeAg. The overall prevalence of HBeAg was 36.7%. Higher prevalence was recorded among women between 20-24 years old (54.5%) followed by 25-29 years old (27.3%). All the HBeAg positive women were from Melanesian ethnic group and 54.5% reside in urban areas.

DISCUSSION

The urgency to address the needs of hepatitis B associated disease and resultant suffering is now being actively addressed with particular attention to those countries with high rates of chronic infection. The hyper prevalence of hepatitis B in the Pacific islands is well accepted but remains poorly defined with gaps in recent data on disease burden. There are complex reasons for this and this study contributes to current understanding in a select cohort of people in Solomon Islands.

We report hepatitis B sero-prevalence rate of 13.8% in this descriptive cross-sectional study of pregnant women attending for their first antenatal visit in seven area health centres in Honiara. Data preceding this dates back to 2008, with comparable rates of 13.7% (41/298) reported amongst a similar antenatal cohort in Honiara, Gizo and Munda^[12]. Their study determined HBsAg using ELISA (Determine and Serodia). Slightly higher rates of 15.8% were reported amongst women aged 15 to 24 years vs 11.9% in women aged 25-44 years^[12]. Our study report similar rates of sero-prevalence based on rapid point of care tests in a similar antenatal cohort and hence have similar biases. These studies are both likely to underestimate the burden of disease due to convenience sampling bias in select age in the female population presenting to health care facilities. However,

Table 1 Demographic characteristics of study participants (*n* = 240)

| Demographic profile | <i>n</i> (%) |
|-------------------------------|--------------|
| Age group | |
| 15-19 | 33 (13.6) |
| 20-24 | 82 (33.7) |
| 25-29 | 50 (23.9) |
| 30-34 | 41 (16.9) |
| 35-39 | 24 (9.9) |
| ≥ 40 | 2 (0.8) |
| Ethnicity | |
| Melanesian | 219 (91.3) |
| Polynesian | 13 (5.4) |
| Micronesian | 8 (3.3) |
| Education level | |
| No education | 19 (7.9) |
| Primary | 72 (30) |
| Secondary | 127 (52.9) |
| Tertiary | 22 (9.2) |
| Occupation | |
| Unemployed | 141 (58.8) |
| Employed (private/government) | 77 (32.1) |
| Student | 20 (8.3) |
| Unknown | 2 (0.8) |
| Residential location | |
| Peri-urban | 111 (46.30) |
| Urban | 104 (43.3) |
| Rural | 25 (10.4) |

it does not distract from the high rate of 13.8%. Other previous data are limited to small studies, in select populations. Study on healthy blood donors reported higher prevalence of HBsAg of 19.6% and 22.3%^[10,11]. Further national random representative sero-surveys are needed to provide a much more accurate assessment of disease burden in Solomon Islands.

We report a trend with increased rates seen with increasing age with peak prevalence of 22% in the 30-34 year group. The increased rates with increasing age may reflect ongoing new infections through sexual contact or other routes including health services. This is proceeded by further decline in the older age group (35-39 years), and no cases seen over the age of 40 years. This decline in the older age group may represent spontaneous sero-conversion over time and nil cases due to small sampling size. No HBsAg positive patients are noted in the youngest cohort (15-19 years). This is likely due to the efforts childhood vaccination program. This draws further attention in the need to ensure high rates of birth dose and vaccination coverage to improve herd immunity and hence overall prevalence over time. Initial effort to assess current vaccination coverage rates as well as addressing the barriers to delivery such as cold chain, birth outside health care facilities and lack of awareness are required.

Amongst the ethnic groups, the highest rates were seen amongst the Polynesian cohort with a prevalence of 23.1% compared with Melanesian and Micronesian (13.2% and 12.5% respectively), lack of statistical significance may be attributed to total numbers recruited for this study, with the largest sampling size from the Polynesian cohort. Similar reports of difference in hepatitis B in

Table 2 Comparison of hepatitis B surface antigen prevalence by selected socio-demographic variables

| | Total | HBsAg positive <i>n</i> (%) | HBsAg negative <i>n</i> (%) | <i>P</i> -value |
|----------------------|-------|--------------------------------|--------------------------------|-----------------|
| Age group | | | | - |
| 15-19 | 33 | 0 | 33 (100) | |
| 20-24 | 82 | 13 (15.9) | 69 (84.1) | |
| 25-29 | 58 | 7 (12.1) | 51 (87.9) | |
| 30-34 | 41 | 9 (22.0) | 32 (78.0) | |
| 35-39 | 24 | 4 (16.7) | 20 (83.3) | |
| ≥ 40 | 2 | 0 | 2 (100) | |
| Ethnicity | | | | 0.513 |
| Melanesian | 219 | 29 (13.2) | 190 (86.8) | |
| Polynesian | 13 | 3 (23.1) | 10 (76.9) | |
| Micronesian | 8 | 1 (12.5) | 7 (87.5) | |
| Education level | | | | 0.143 |
| No education | 17 | 5 (26.3) | 14 (73.7) | |
| Primary | 77 | 7 (9.7) | 65 (90.3) | |
| Secondary | 127 | 16 (12.6) | 111 (87.4) | |
| Tertiary | 22 | 5 (22.7) | 17 (77.3) | |
| Occupation | | | | - |
| Unemployed | 141 | 16 (11.3) | 125 (88.7) | |
| Employed | 77 | 15 (19.5) | 62 (80.5) | |
| Student | 20 | 2 (10.0) | 18 (90.0) | |
| Unknown | 2 | 0 | 2 (100) | |
| Residential location | | | | 0.112 |
| Urban | 104 | 13 (12.5) | 91 (87.5) | |
| Peri urban | 111 | 13 (11.7) | 98 (88.3) | |
| Rural | 25 | 7 (28.0) | 18 (72.0) | |

HBsAg: Hepatitis B surface antigen.

ethnic groups are reported from 1994 with highest rates of hepatitis B seen in Micronesians (28.1%), followed by Melanesians (20%) and then Polynesians (8.4%)^[10]. This ethnic variation is well reported from other parts of the Pacific islands and further understanding of this relevance will assist in the contribution to the understanding of the disease, mode of transmission, disease progress and management strategies. Further work into this is clearly warranted.

Although the prevalence of hepatitis B is noted to be higher in those from rural settings (28%) as compared to those from urban and periurban settings (12.5% and 11.7%), this does not reach statistical significance. There is likely to be a number of factors contributing to this difference including vaccination coverage as well as ongoing risk of horizontal transmission modality and access to health care. Hepatitis B rate is also likely to have geographical variations in different islands. Improved understanding to address this gap is warranted with majority of the population (80.2%) in Solomon Islands living in rural areas where access to clean water and sanitation is not reliable^[7]. These resource barriers are likely contributors to higher rates of hepatitis B, and ongoing risks of new infection.

Our study for the first time reports the prevalence of HBsAg among pregnant women in Solomon Islands. The overall prevalence of 36.7% is comparable to the rates reported among mothers and the general population. Furusyo *et al.*^[10], reported an overall prevalence of 41.3% among 315 HBsAg positive adult patients attending

general outpatients and blood donors. The prevalence did not differ by sex however patients from Melanesian ethnic groups had significantly higher HBeAg seropositive compared to the other two ethnic groups. Another study among mothers of children who received vaccination reported HBeAg prevalence of 40.7%^[30]. Subsequently in 2001, seroprevalence of 35% was reported among 206 blood donors with chronic hepatitis^[14]. All studies reported a progressive decline in HBeAg sero-prevalence with increasing age. Wilson *et al*^[31], reported high prevalence of HBeAg among pregnant women in the Pacific region which ranged from 48% in Kiribati to 70% in Fiji. HBeAg determines infectivity. High prevalence of HBeAg in pregnant women coupled with low up take of birth dose vaccine in Solomon Island increase the risk for vertical transmission of HBV to their newborns.

Only 4.6% of women screened had received previous hepatitis B vaccination. This low rate represents an opportunity to increase awareness and improve vaccination coverage. More than half the women were not aware of their vaccination status. Despite the routine introduction of childhood vaccination for hepatitis B in 1990-1991, only 65.2% of women with children under the age of 5 were able to report that their child/children had received vaccination. One in three mothers was not aware of their child's vaccination status. This gap in awareness about the vaccination requires attention, with opportunities for education for community as well as health care workers. Birth dose vaccination coverage as well as completion of the three doses remains a significant challenge in resource poor setting and efforts to evaluate this in Solomon islands and address the specific barriers is needed. In particular, challenges include remote settings, lack of cold chain, engagement of health care workers and competing needs of antenatal care, as well as access to vaccines. Solomon Islands have one of the lowest birth dose coverage (45%) in the WHO-Western Pacific Region^[27]. There are potential solutions to address these gaps that require resource allocation and prioritization with burden compounded by the remote settings. Hence, programs that explore integration into currently systems are should be considered. Even with optimal vaccination delivery, the protective coverage of vaccination is 70% in those born to positive mothers vs 81% to those born to hepatitis B negative mothers^[31]. Hence, efforts to address this ongoing risk of vertical transmission and its associated high risk of progression to chronic lifelong infection are needed.

The screening tool used for this study was a point of care test (Standards Diagnostics). The 5% of negative samples tested by Murex HBsAg version 3 ELISA method is considered as quality control in the study. According to testing kit evaluation made by independent studies (including WHO), on a number of commercial HBsAg rapid tests, the Murex HBsAg version 3 ELISA is able to detect 0.13-0.21 IU/mL surface antigen concentration with a clinical sensitivity of 100% by one study^[32,33]. Standard Diagnostics testing kits allows for rapid detection of the HBsAg which is an antigen associated

with hepatitis B. This antigen usually becomes positive very soon after infection and persists if the person is unable to develop protective antibodies, indicating chronic infection if present after 6 mo. These rapid point of care test kits are utilized mostly in resourced limited settings, are cheap, easy to use and interpret and requires less laboratory skills and does not need instruments. On the other hand, ELISA which is the most preferred screening technique with accuracy of 99.9% is time consuming, laborious and needing proficient skills to perform^[34,35]. Thus rapid HBsAg tests serves as the common testing methods in the Solomon Islands for screening of antenatal mothers, blood donors and patients.

HBV viral load testing remain outside the scope of most of these resource poor settings both in terms of cost of equipment, consumables as well as training for laboratory staff. Additional information is required on the performance characteristics of these rapid tests in terms of their current on field performance and factors that may affect it including cut off viral load, contribution of diversity in hepatitis B variants and the effect of hepatitis B therapy. Other tests that are potentially of use include the use of hepatitis B surface antibody tests and core antibody tests which could add value to the overall understanding of the viral replication status and hence infectivity with potential role in the monitoring of patients who are found to be positive on screening. Further, rapid tests may not be able to detect occult hepatitis B infection, this remaining an area of further study. Although these rapid tests have a clear role, the need for additional laboratory services needs to be considered. Models including the establishment of reference labs could be explored.

The cost effectiveness of routine screening for HBsAg has not been fully investigated. Routine screening of pregnant women for hepatitis B has not been included in the WHO optimum service package for ANC. This could be due to concern over its cost effectiveness and support for mathematical modeling for funding purposes would help clarify. Currently, some PICs countries have included routine screening for Hepatitis B in their ANC package^[36-39]. In Fiji and French Polynesia, screening is recommended during the first ANC visit and newborns of seropositive mothers are given immunoglobulin as well as birth dose vaccines at birth followed by three subsequent vaccine doses^[36,37]. Similarly in Vanuatu, universal screening of pregnant women for HBsAg was commenced in Port Vila hospital in 2013^[39]. In Solomon Islands, introduction of routine screening of pregnant women for HBsAg before childbirth would have two benefits. First, it will enable prompt identification of newborns of positive mothers for the provision of vaccine immediately after birth and subsequent follow up for completion of vaccination. Secondly, in high endemic areas it provides opportunity to immunize HBsAg negative pregnant women (if they have not been immunized) who are at high risk of infection in the community. Identification, screening and vaccination of contacts of positive patients could also be implemented. This targeted immunization coupled with ongoing promotion of current universal

immunization program could provide an opportunity to increase uptake of birth dose and overall hepatitis B vaccine coverage in infants.

Clearly, allocation of resources to allow this both in terms of cost and supporting services related to its delivery is required but need commitment from government. Solomon Islands could provide an example of models of care with an integrated program including awareness, prevention, screening, diagnostics, therapy and management through engagement and education. Specific local needs and resources require attention with focus on efficient delivery of care integrating hepatitis B programs into currently existing program as not to unnecessarily to the existing burden of stretched resources. This could form part of a national strategic plan for the delivery of hepatitis B services in Solomon Islands.

This study found a high rate of HBsAg and HBeAg prevalence among pregnant women in Honiara, with low level of awareness and vaccination uptake among women and their children. The challenges in hepatitis service in Solomon Islands are both unique and similar to those of the many of islands and atolls of the Pacific. Availability and access to care can be addressed by small steps and integration of currently available resources and programs without the need for introduction of separate programs and its associated funding requirements and complex strategies. Rapid point of care tests for screening and diagnosis are also available for further study. The WHO treatment and care guidelines in 2015 provide a framework with direction to further promote momentum on a broader scale to address the multiple facets needed to support hepatitis related service delivery in the resource poor setting^[40].

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COMMENTS

Background

The Solomon Islands is located in the Southwest Pacific and has total population of 515870. Hepatitis B surface antigen (HBsAg) prevalence of 19.6% was reported among the general population in 1994. Surveillance reports and prevalence studies in population sub-groups such as pregnant women and blood donors also reported high level of chronic infection, with 14.5%-16% in pregnant women and 25% in blood donors. Hepatitis B vaccine was introduced in the national immunization program in 1990-1991 and is recommended for infants at birth, 6, 10 and 14 wk of age. In 2009, the coverage of hepatitis B vaccine was 45% at birth and 81% for ≥ 3 vaccines.

Research frontiers

Hepatitis B infection is hyper endemic in Solomon Islands. Ongoing trans-

mission at birth and in early childhood is likely to continue to contribute to the significant burden of disease. However, there are no recent seroprevalence studies to document the current burden of disease. The research hotspot is to contribute a clearer understanding of the current status of chronic HBV infection in a cohort of antenatal women and provide evidence based information for national HBV prevention and control strategies.

Innovations and breakthroughs

The hyper prevalence of hepatitis B in Solomon Island is well accepted but remains poorly defined with gaps in recent data on disease burden. This study enrolled 240 pregnant women attending antenatal care in Honiara and found a high rate of HBsAg and hepatitis B e antigen (HBeAg) prevalence with low level of awareness and vaccination uptake among pregnant women and their children respectively.

Applications

This study found a high rate of HBsAg and HBeAg prevalence among pregnant women which suggests the increased risk of perinatal transmission of HBV. Moreover, the study provided background information on hepatitis B disease burden and described the various challenges and proposed integrated approach for HBV control in Solomon Islands.

Peer-review

The study design, material-methods are appropriate for the aim. The results are typical for a HBV endemic population but somewhat limited. It would have been more interesting if anti-HBs and anti-HBc total results of the study group were also provided.

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