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A Study to Assess the Hb Vaccination Status of the Patients Attending NIUM, Bangalore

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ABSTRACT

Background: Hepatitis-B is a disease which is becoming vulnerable and contributing a large man power as well as economical loss worldwide. It is a serious and common infectious disease of the liver affecting millions of people worldwide. The best way to culminate it, is, creating awareness about the disease and administration of vaccination in the general population, in children through immunization schedule. The present study focuses to see the level of vaccination status of the population of Bangalore city.

Objectives: The main objective of the study the prevalence of HB vaccination status of the Patients Attending National Institute of Unani Medicine, Bangalore.

Materials and Methods: The present study was a hospital based cross-sectional study. In this study every 10th patient from the registration register of NIUM hospital was taken and enquired about the HB vaccination, till the statistically calculated sample size of 903 was obtained.

Results: The study revealed that the people of Bangalore city, which is counted among the cities having high literacy rates in India, merely 15 i.e. 2% out of 903 people had found vaccinated against HB virus infection.

Conclusion: In the present the study 15 i.e. 2% out of 903 people were found vaccinated against HBV infection. The overall carrier rate is often quoted as 4.7% among the populations studies based on meta analysis. The outcome of this study shows that people of Bangalore city were not found much aware about the vaccination and are at high risk to develop and spread of the disease. More studies with larger sample size should be conducted to refine these results so that more awareness programs should be conducted to create the awareness among the people of Bangalore city.

Keywords: Hepatitis B; HB vaccination; HB awareness, vaccination status.

INTRODUCTION:

Hepatitis B is one of the most killer diseases found on the earth. Hepatitis-B is such a disease which is life threatening and contributing a large man power as well as economical loss worldwide. It is a serious and common infectious disease of the liver affecting millions of people worldwide.[1] It is caused by hepatitis-B virus which can be transmitted through percutaneous i.e. puncture through the skin and mucosal route i.e. direct contact with mucosal membrane, exposure to infectious blood or blood products, through the body fluids.[2] Vertical transmissions of the virus i.e. from mother to child, unsafe sexual inter-course are also important routes for the transmission of the disease. The protection and prevention from this killer disease is of prime necessity. This only can be done through the awareness and vaccination against HBV infection. The awareness about the vaccine of HB is of prime importance so that the morbidity and mortality of the disease can be lesson down. Keeping this in mind the present study was done to know the level of awareness about the disease and its vaccination. After this study we will be able to know the further steps needed in future in the immunization programs and also to convince people for the proper vaccination.

HISTORICAL BACKGROUND:

Hippocrates first described the existence of epidemic jaundice as early as 400 BC; further outbreaks of jaundice were documented in Europe in the 17th and 18th century AD, notably during periods of contact. Since then till world war second (II), the existence of viruses as the major cause of liver disease was unknown. The distinction

between "infectious and serum hepatitis by Krugman and colleagues in 1967 and the discovery of the Australian antigen by Blumberg and co-workers, later that year were land mark that led an increase in our knowledge of viral hepatitis.[3,4,5]

The use of serologic markers, the Australian antigen provided the means for the epidemiology of hepatitis-B virus (HBV) infection. Further development included the identification of the virus as a 42-nm particle (Dane-particle) containing an outer coat, the hepatitis-B surface antigen (HBsAg), and an inner core, the hepatitis-B core antigen (HBcAg); the development of specific test to detect the hepatitis-B antigen and their respective antibodies, the transmission of the infection to chimpanzees and the development of a specific hepatitis-B immune serum globulin. In 1975, Krugman produced a crude vaccine for HBV infection by boiling the serum of a patient with HBV and was able to prevent transmission of hepatitis-B in human subjects. Heptavax, a "first-generation" hepatitis-B vaccine, in the 1980s, was made from HBsAg extracted from the plasma of hepatitis patients. Current vaccines are made from recombinant HBsAg grown in yeast.[6] The introduction of hepatitis-B vaccine in early 1980's and adoption of universal childhood vaccination policies in many countries resulted in a dramatic, about 90% decline in the incidence of new HBV infection as well as in the dire consequences of chronic infection in those countries.[7,8]

EPIDEMIOLOGY:

Hepatitis-B is the 10th leading cause of death in the world, on the other hand hepato-cellular carcinoma (HCC) ranks 5th among the most frequent cancer in human.[9] Now hepatitis-B is becoming a public health problem of increasing concern worldwide, especially in developing countries. Globally about 2 million people are infected with HBV, 350-400 million are chronic carriers and tens of millions of new cases occur annually, of those infected 15-40% develop cirrhosis or hepatocellular carcinoma.[1]

According to WHO survey more than 2000 million people alive today have been infected with HBV at some time in their life, of these, about 350 million remain infected chronically and become carrier of the virus. Three quarters (3/4) of the world's population live in high endemicity areas. Every year 4 million acute clinical cases of HBV occur and about 25% of them become carriers. One million people a year die from chronic active hepatitis, cirrhosis or primary cancer.[1] We can easily asses that hepatitis-B is a kind of disease which is responsible for millions of deaths worldwide thus it is of public health concern. These deaths can be avoided or at least can be minimize up to great extent by simply creating awareness among the people and by the implementation of the hepatitis-B vaccination among the adults and especially in children. Vaccination against HBV infection can be started at birth and provides long term protection in more than 90% of healthy people.[10] Safe and effective vaccines have been available to prevent hepatitis-B infections since 1981. In 1992, the WHO recommended that childhood hepatitis-B vaccination should be included in immunizations programmes of all countries. Over a decade later in 2003, 151(79%) of 192 member countries had adopted universal childhood hepatitis-B vaccination policies.[11] This has produced a remarkable reduction in HBV related diseases e.g. in Taiwan, the prevalence of chronic infection in children declined by more than 90%.[6,10]

Regions are divided into areas of low (<2%) prevalence, intermediate (2-8%) and high (>8%) prevalence.[12]

In India hepatitis-B is a major health problem. India has intermediate prevalence of HBsAg i.e. 2-10%.[13,14] The overall carrier rate is often quoted as 4.7% [15] among the populations studies based on meta analysis.[16] The prevalence does not vary significantly region wise in the country. The number of HBsAg carriers in India has been estimated to be over 40 million (4 crore).

PREVENTION:[10]

Following strategies exist for the prevention of HBV infection:

1. Behavioural modification to prevent disease transmission.
2. Education.
3. Passive immunoprophylaxis.
4. Active immunisation.

Behavioural modification: Change in sexual practices in response to HIV infection have probably contributed to the decline in incidence of HBV infection, and improved screening measures of blood products have reduced the risk of transfusion associated hepatitis. Other primary preventive measures, such as needle exchange programmes for drug users, are more difficult to implement but are potentially useful. Behavioral modification is unlikely to be beneficial in developing countries, where neonates and children in early childhood are at the greatest risk of acquiring infection.[17]

Education: This is also an important method for declining the incidence of HBV infection. Proper education and knowledge about the risk factors, mode of transmission and consequences of the disease can decrease the incidence among the people of the world.

Passive immunoprophylaxis: Passive immunoprophylaxis is recommended in four situations:

1. Neonates born to HBsAg positive mothers
2. After needle stick exposure
3. After sexual exposure

4. After liver transplantation in patients who were HBsAg positive before transplantation

The mechanism by which anti-HBsAg prevents infection is uncertain. Immunoprophylaxis is recommended for all infants born to HBsAg positive mothers. This is performed, ideally, in combination with universal screening of all pregnant women for HBsAg, as has been recommended by the CDC. Current dosing recommendations are 0.13 ml/kg anti-HBsAg immediately after delivery or within 12 hours after birth in combination with recombinant vaccine. The combination results in a higher than 90% level of protection against perinatal acquisition of HBV. Between 3% and 15% of infants still acquire HBV infection perinatally from HBV- infected mothers, despite immunoprophylaxis.

After sexual or needle stick exposure, recommendations are to administer anti-HBsAg in the dose of 0.05-0.07 ml/kg as soon after exposure as possible, preferably within 48 hours and not more than 7 days after exposure. A second dose 30 days later may decrease the risk of transmission of HBV. Active immunisation should be administered concurrently.[17] Repeated HBIG injections are being used to prevent re infection of a donor liver inserted into HBV DNA positive patient.[18]

Active immunisation: Prevention of primary infection by vaccination is an important strategy to decrease the risk of chronic HBV infection and its subsequent complications.[17,19] Vaccines are prepared from the uninfectious outer surface of the virus.[18] The standard regimen is three doses of 20µg in adults and 10µg of vaccine in children. Although this vaccine is highly effective (85-95% of healthy individuals develop anti-HBs after the administration of three doses), concern about the transmission of other infectious agent led to the development of recombinant vaccines. Recombinant vaccines are made by incorporating the surface antigen gene of HBV into different expression vectors (yeast, E. coli or mammalian cell lines). The yeast derived recombinant vaccines are most widely used.[19]

Protective level of antibody persists in the majority of responders (68% at 4 years). Even if antibody levels decline so that anti-HBs become no longer detectable, this does not necessarily equate with loss of protection. Patients frequently have an amnestic response when re exposed to HBV, and *in vitro* studies of B-cells obtained from such individuals have demonstrated intact immunologic memory. Therefore, routine testing of vaccinated individuals and routine booster vaccinations are not recommended. In selected circumstances, particularly individuals at high risk of acquiring infection are vaccinated (e.g. children of HBV-infected mothers), documentation of seroconversion may be prudent. Furthermore, revaccination of such high-risk individuals after 5-10 years may be appropriate if anti-HBs titres have declined to less than 10 IU/L.

Immunocompromised patients, including those receiving haemodialysis have a reduced chance of mounting a protective immune response after vaccination. Additional and higher dose of the vaccine appear to increase the response rate. Hepatitis-B vaccines, administered in three injections distributed over six months, are highly immunogenic in the vast majority of neonates, children, and immunocompetent adults but less so in the elderly and immunocompromised. Vaccination is unnecessary if the person has a positive HBsAb or HBcAb. The long term protection depends on the antibody response which is 85-100% in healthy young subjects. Anti-HBs should be measured 1-3 months after completion of the basic course of vaccine.[18]

Non-responders have peak anti-HBs levels of ≤10IU/L and lack protection. Low responders have anti-HBs levels of ≤ 10-100IU/L and generally lack detectable anti-HBs levels within about 5-7 years. They may respond to a further booster of double the dose of vaccine. Good responders have peak anti-HBs ≥100IU/L and usually have long term immunity.

Some other vaccines: The simplest vaccine is derived from heat-inactivated plasma containing HBsAg and is based on the original observation of Krugman *et al*, who boiled infectious hepatitis-B positive serum and showed it protected against hepatitis-B.[18]

Polypeptide vaccines are composed of specific immunogenic antigenic determinants of HBsAg.

MATERIAL AND METHODS:

Protection of health and prevention of disease has been the endeavor of human beings since time immemorial. Present study was aimed at finding out the prevalence of HBV carriers and creating awareness about HBV vaccinations among people of Bangalore. By knowing the prevalence we can predict the future risk of HBV infection in the Bangalore city community, so that, the preventive measures can be recommended, planned and implemented at appropriate place and at appropriate time.

Lodha *et al* concluded on the basis of Meta analysis that prevalence of hepatitis-B in India was 1-2%.[20,21] The infections (HIV, HBV and HCV) are preventable mainly by health education, safe sex, precautions in blood transfusion and the use of disposable syringes and razors etc.[16]

RESULTS AND DISCUSSION:

As shown in Table No.1, in the present study, out of 903, 88(10%) patients were observed in age group of 1-19, 178(20%) were in age group of 20-29, 225(25%) patients were in 30-39 years age group, 169(19%) patients were in 40-49 years age group, 120(13%) patients were in 50-59 years age

group, 96(10%) patients were in 60-69 years age group and 27(3%) patients were in 70 & above years age group.

As shown in Table No.2, in the present study sexual distribution revealed out of 903, male patients were observed as 503(56%) while 400(44%) were observed as females.

As shown in Table No.3 the present study consisted of 98% volunteers from Bangalore while the 2% were from outside the Bangalore. On the basis of this finding it can safely be said that the sample was representative of Bangalore city, as, the data was recorded on the basis of birth place, not on residence. So, this sample can be quoted as of Bangalore city which was further substantiated by the observations of 100% urban resident of Bangalore.

As shown in the Table No.4 in the present study, the occupational distribution of under studied sample was enquired as Unemployed, Semiskilled, skilled and Professionals, occupational percentage was as 69%(620), 20%(178), 9%(82), and 2%(23) respectively. Profession bears a direct relation with chances of exposure to HB as some professions are such in which chances of frequent injuries are very high e.g. laborer, tailor, barber etc. These professionals may contact HB inadvertently.

As shown in the Table No.5 in the present study, Distribution of Patients according to vaccination status with Hepatitis-B infection of under studied sample was found that only 15(2%) were vaccinated with HB vaccine and 888(98%) did not vaccinated with HB vaccine. This indicates that in a community like Bangalore which is considered one of the most literate city of India and also considered as IT city of India, the people are not much aware about the HB infection and the importance of its vaccination which is very strange and hard to be believed.

CONCLUSION:

Limited studies have been conducted so far to know the prevalence of HB virus in India and only few studies have been conducted in Bangalore. Hospital based study can't represent any area confined community. But the sufficient sample size may help in knowing the city's prevalence and may pave the way for area confined studies. Hospital always attracts the representative sample of whole community from near and remote areas. Sample from hospital can't definitely be attributed to a particular area of the city.

Reffernces:

1. Anonymous. World Health Organisation, Department of Communicable Disease. Surveillance and Response Hepatitis B. Report 2002 No. WHO/CSR/LYO/2002.2.
2. Anonymous. CDC (2006). A comprehensive immunization strategy to eliminate transmission of hepatitis-B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). Part 11: immunization of adults. MMWR: 55(RR-16). Recommendations and Reports December 2006;55(RR16):1.
3. Mandell GL, Bennett JE, Dolin R. Principles and Practice of Infectious Diseases. 6th edi. Philadelphia: Elsevier publications; 2005:443-444.
4. Armstrong D, Cohen J. Infectious Diseases. 1st edi. Vol.1. London: Harcourt Publishers Ltd; 1999:39.1-39.12.
5. Mahoney FJ. Update on Diagnosis, Management and Prevention of Hepatitis-B Virus Infection. Clinical Microbiology Reviews 1999;12(2):351-366.
6. HBsAg [internet] cited 2010 June 28. Available from http://en.wikipedia.org/wiki/Antigen.
7. Wilson RA. Viral Hepatitis. New York: Marcel Dekker; 1997:85-117.
8. Jain A K, Mittal S.K, Ramji S, Chakravarti A. Hepatitis-B Vaccine in the EPI Schedule. Indian Journal of Paediatrics 2005;72(8):661-664.
9. Chen DS. Toward Elimination and Eradication of Hepatitis-B. Journal of Gastroenterology and Hepatology 2010;25:19-25.
10. Shepard CW, Simard EP, Finelli L, Fiore AE, Bell BP. Hepatitis-B Viral Infection: Epidemiology and Vaccination. Epidemiological Reviews 2006;28:112-125.
11. Goldstein ST, Zhou F, Hadler SC, Bell BP, Mast EE, Margolis SM. A mathematical model to estimate global Hepatitis-B disease burden and vaccination impact. International Journal of Epidemiology, 2005;34:1329-1339.
12. Carey W D. The Prevalence and Natural History of Hepatitis-B in the 21st Century. Cleveland Clinic Journal of Medicine 2009;76(3):52-55.
13. Kant L, Hall AJ. Epidemiology of Childhood Hepatitis in India: Vaccination Related Issues. Indian Journal of Paediatrics 1995;62:635-653.
14. Sarin S K. HBV prevalence, Natural History, and Treatment in India and Indian Americans in United States. Current hepatitis reports 2009;8:31-38.
15. Mann A, Arora U. Prevalence of Hepatitis-B Virus, Hepatitis-C Virus, and HIV in Patients with Chronic Liver Disease in Amritsar. JIACM 2007;8(1):29-37.
16. Khan MA, Ashraf M, Rehman A, Ali A, Ashraf A, Ditta A. Prevalence of HBV, HCV, HIV in Blood Donors at Liyaqatpur. Professional Medical Journal 2006;13(1):23-26.

17. Feldman M, Sleisenger MH, Scharschmidt BF. Sleisenger and Fordtran's Gastrointestinal and liver Disease. Vol.2. 6th edi. WB Sounders Company; 1998:1123-1170.
18. Sherlock S, Dooley J. Disease of the Liver and Biliary System.10th edition. London: Blackwell Science Ltd; 2002:274-286.
19. Moxon ER. Modern Vaccines Current Practice and New Approaches. London: Edward Arnold; 1990:75-83.
20. Batham A, Narula D, Toteja T, Sreeniwas V, Pulyel JM. Systematic Review and Meta-Analysis of Prevalence of Hepatitis-B in India. Indian Paediatrics September 2007; 44:633-674.
21. Sudan SS, Sharma RK. Prevalence of Hepatitis-B and C in CRF Patients on Maintenance Haemodialysis [internet] cited 2010 April. Available from http://www.bhj.org/journal/2003_4502_april/index.htm.

FIGURES AND TABLES:

Table No. 1
Distribution of Patients according to Age
(n=903)

Age (in year)	No. of Patients	Percentage (%)
1-19	88	10
20-29	178	20
30-39	225	25
40-49	169	19
50-59	120	13
60-69	96	10
70 & above	27	3
Total	**903**	**100**

Figure No. 1
Distribution of Patients according to Age

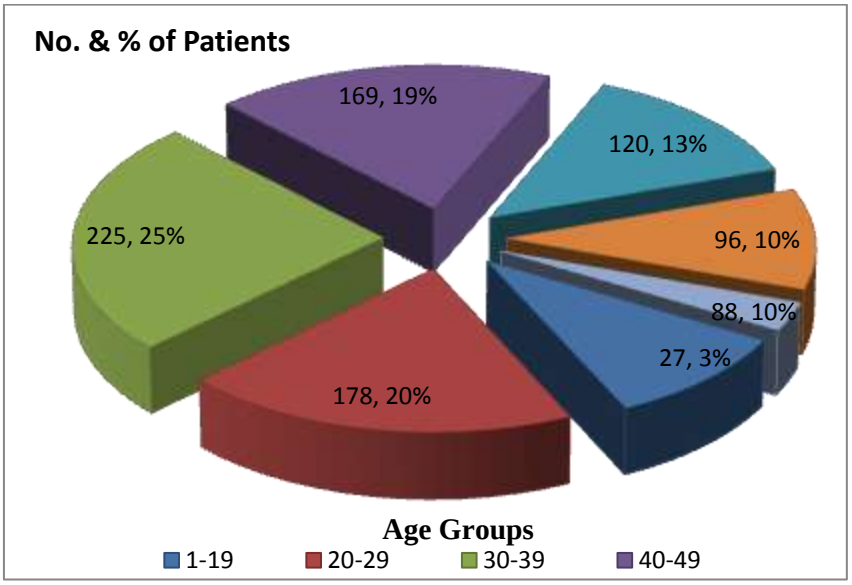

Table No. 2

Distribution of Patients according to Sex
(n=903)

Sex	No. of patients	Percentage (%)
Male	503	56
Female	400	44
Total	**903**	**100**

Figure No. 2
Distribution of Patients according to Sex

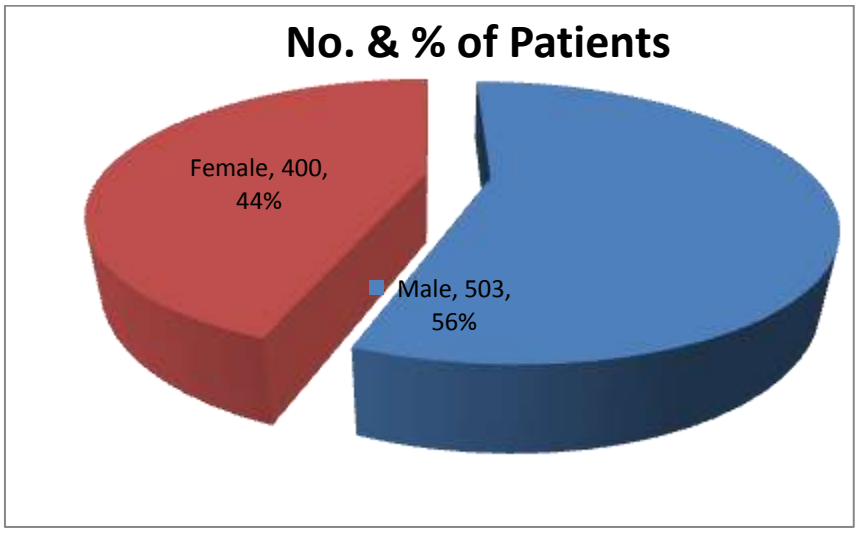

Table No. 3
Distribution of Patients according to Place of Birth
(n=903)

Place of Birth	No. of Patients	Percentage
Bangalore	886	98
Outside Bangalore	17	2
Total	**903**	**100**

Figure No. 3
Distribution of Patients according to Place of Birth

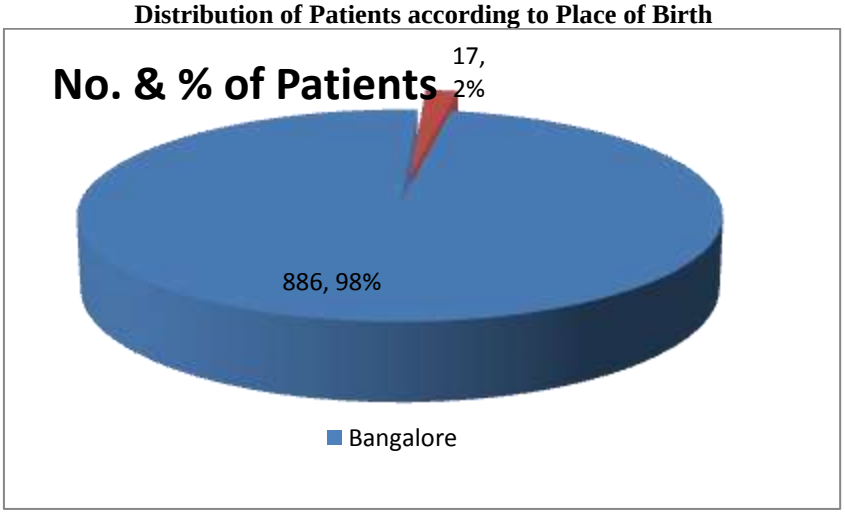

Table No. 4
Distribution of Patients according to Occupation
(n=903)

Occupation	No. of Patients	Percentage
Unemployed	620	69
Semiskilled	178	20
Skilled	82	9
Professionals	23	2
Total	**903**	**100**

Figure No. 4
Distribution of Patients according to Occupation

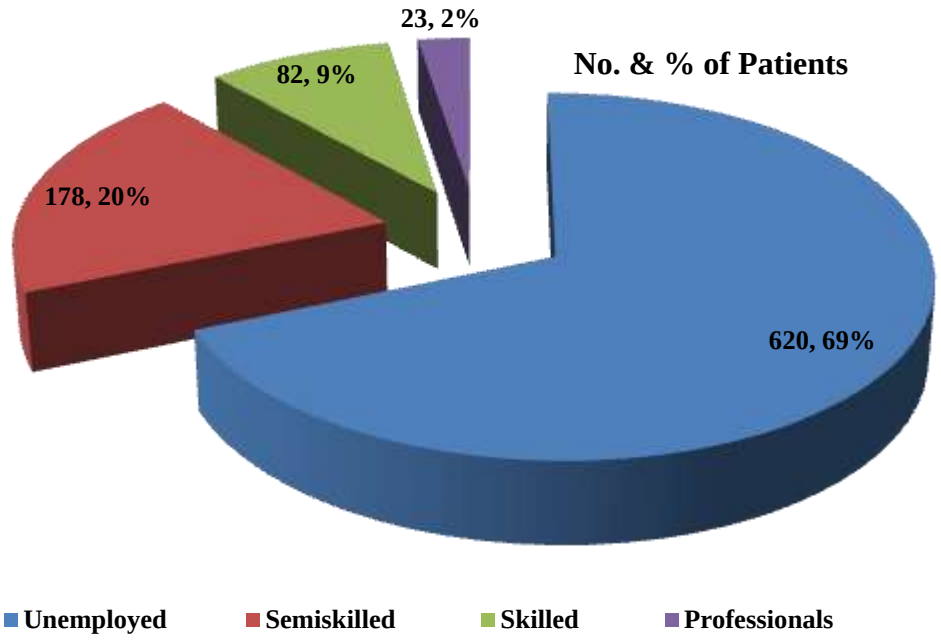

Table No. 05
Distribution of Patients according to Vaccination Status
(n=903)

Vaccination Status	No. of Patients	Percentage
Vaccinated	15	2
Non - vaccinated	888	98
Total	**903**	**100**

Figure No. 05
Distribution of Patients according to Vaccination Status