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REVIEW ARTICLE

COMMUNITY BASED MODEL OF HEPATITIS B ELIMINATION IN TRIPURA, NORTH EAST INDIA

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Abstract

Liver can be affected by various virus like Hepatitis A, B, C, D, E. Hepatitiss B and C are blood borne and can cause chronic complications leading to chronic liver disease, cirrhosis and hepatocellular carcinoma. In 1984 Taiwan launched first universal vaccination against Hepatitis B with plasma derived vaccine and they could reduce the burden significantly with in a short period. In 1987 recombinant DNA vaccine become available and hepatitis B vaccination became a target area but the the program did not received proper momentum. A science based social orbanisation, Hepatitis Foundation of Tripura started hepatitis B prevention movement at Tripura, a small state of North East Region of India in 2002. Gradually the program extended following various public heath method. This out of the box model could achieve a great success towards elimination of Hepatitis B. This Tripura model adopted by a social organisation, could act as template for HBV elimination.

Introduction:

Liver is seat of soul. For thousands of year Liver is known to be one of the most important organ of body. Liver has got enormous regenerative capacity. But still small Hepatitis viruses can destroy liver. There are five Hepatitis Viruses, these are Hepatitis A, B, C, D, & E. Out of these B and C are most harmful as they can lead to chronic complication like chronic liver disease, Cirrhosis and liver cancer. Among these prevalence of Hepatitis B is highest and it can cause both acute and chronic liver disease. Hepatitis B virus was discovered in 1965. Hepatitis B is very much vaccine preventable by a highly effective and safe recombinant DNA vaccine , which was easily available since 1990 but response from most of high disease burden country were not satisfactory.

Heatitis B: History:

1. Hepatitis B virus was discovered 1965 by Bloomberg and in 1982 Hepatitis B vaccine first became available. In 1984 Taiwan launched first universal vaccination against Hepatitis B with plasma derived vaccine. In 1987 Recombinant DNA vaccine becomes available.
2. 1992: WHO recommended that all countries integrate Hepatitis B (Hep B) vaccine into national immunization programs by 1997.
3. 1998: WHO Conference Regarding Disease Elimination and Eradication as Public Health Strategies concludes **Hepatitis B a primary candidate for elimination or eradication".**
4. 2007: Over 88% of member states (171 out of 193) have introduced Hep B at birth vaccination in expanded program of immunization.

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5. 2008: SAGE strongly recommends "all regions and associated countries develop goals for hepatitis B control appropriate to their epidemiologic situations".
6. 2010: World Health Organization declared "28th July" as World Hepatitis Day.
7. SDG: 3.3 (2015)"By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat **hepatitis**, water-borne diseases and other communicable diseases."
8. In 2016, World Health Assembly adopted the Global Health Sector Strategy on viral hepatitis to eliminate hepatitis by 2030.

Global Strategy Of Hepatitis B Elimination :
In May 2016; the World Health Assembly adopted the first Global health sector strategy on viral hepatitis, The strategy highlighted the critical role of universal health coverage and sets targets that align with those of the Sustainable Development Goals. The strategy proposed the elimination of viral hepatitis as a public health threat by 2030 (defined as a 90% reduction in new infections and a 65% reduction in mortality, compared with the 2015 baseline), and included a roadmap towards elimination by implementing key prevention, diagnosis, treatment and community interventions strategies.

In May 2022 the 75th World Health Assembly noted a new set of integrated global health sector strategies on HIV, viral hepatitis and sexually transmitted infections for the period of 2022–2030. Based on these previous and now new strategies, a broad range of Member States have developed comprehensive national hepatitis programmes and elimination strategies guided by the global health sector strategy.

Pioneering Hepatitis B Eradication Strategy Adopted In Tripura:
Tripura, is a small state of North Eastern region of India, having an area of 10,492 km² out of which two third is difficult terrain. A social organisation of Tripura took an advanced strategy to make the people aware and vaccinate, screen and treat Hepatitis B patients, to reduce Hepatitis Burden.

This out of the box program was conceived, Conceptualized and materialized by Hepatitis Foundation of Tripura, a science based social organization working in the field of liver disease since 28th July 2002, with Voluntary activists from different profession like Doctors, Nurses, Engineers, Social activists, health care providers, teachers, administrators, businessman and others. The basic aim of Foundation was "Hepatitis Free Tripura" by adopting the norm of "Awareness, Immunization and Diagnosis & Treatment"(AID).

Scenario Of Hepatitis B In Tripura:
[3]The total population of Tripura is around 40 lacs (predicted) and out of this 31% are from aborigine group .The average prevalence of Hepatitis B in Tripura is 3.6%. It is much higher among the tribal groups(5.3 %) in comparison to non tribal community (1.97 %) . Chakma community is having highest Hepatitis B prevalence of 11.4 %, followed by Reang (7.69 %),Noatia (6.09 %), Jamatia (5.7 %), Murasing (5.15 %) Tripuri (4.9%) Halam (4.21%) & Lusai (2.74%)

The commonest cause of chronic liver disease in Tripura was Hepatitis B.

Hepatitis B Vaccination Movement At Tripura : [1,2,3]
Hepatitis Foundation of Tripura started mass Hepatitis B vaccination as early as 2002. It was largely debated that what should be vaccination strategy: 1. Only High risk group vaccination or 2. Mass vaccination.

It was observed that in India or Tripura apart from vertical transmission, horizontal transmission is equally prevalent. In Tripura and most of states of India the average prevalence of HBV is 3 to 5 %. Hence mass Hepatitis vaccination is needed to reduce the burden of Hepatitis B.

Accordingly Hepatitis Foundation decided to adopt the policy of mass vaccination, covering individual of all age group. Initially piloting of vaccination started at Agartala , the capital city of Tripura. Gradually the mass Hepatitis B vaccination program extended to district and sub district and taluka level. Due to extensive awareness program the vaccinatio program got tremendous momentum. It has received extensive acceptance and support and continued up to August 2019. Ultimately, it became a great public health movement.

The Hepatitis B vaccination Program in Tripura from 2002 – 2019 can be divided into four phases:

1. Inception Phase: 2002 to 2008.
2. Hepatitis B Eradication Program: 2009 to 2011.
3. At Birth Hepatitis B vaccination Program – 2011.
4. Maintenance vaccination Program: From 2012

Inception phase: 2002 to 2008: During this period the foundation continued to expand its activity from state capital Agartala to District and Sub district level by awareness development and vaccination increased gradually.

Hepatitis B eradication program: [1] This historical program was performed for three consecutive years (2009, 2010 & 2011). Hepatitis B vaccination program was carried out across the state on a single day.(Pulse HBV vaccination). The program was preceded by mass awareness program utilizing all possible modalities of dissemination of information education & communication. In 2009 on one single day (29th November 2009) about 1.21 lacs people were vaccinated in Tripura. The program was well accepted at urban and rural area alike. In subsequent years also the vaccination program got similar success. This is the first mass Hepatitis B vaccination program organised probably in the country.

At Birth Hepatitis B vaccination program 2011**:** On 7st January 2011, the foundation launched a new program "At Birth Hepatitis B vaccination Program". The vaccination was carried out in all Govt. Hospitals by the Hepatitis foundation of Tripura. All new born children were given Hepatitis B vaccine at Hospital, followed by second and third dose after discharge at 1 and 6 months at clinics of Hepatitis Foundation of Tripura. This is first mass at birth Hepatitis B vaccination program in India.

In December, 2011, the Government of India took over the program, as a national program. Since then the at birth (0 – 1 year) Hepatitis B vaccination program being carried out at all Govt. Hospitals by the Govt.

Maintenance vaccination program from 2012 (targeted vaccination): After the success of mass vaccination program the Foundation shifted the attention to targeted areas by taking the special program: "Target area vaccination" like Municipality area, Block area, Gram Panchayet and specific Tribal area (Autonomous District Council Area). The program continued up to August 2019. After 26 August 2019 this historical program was discontinued due to unavoidable circumstances and lacs of people were deprived of benefit of Hepatitis B vaccination through this program. The movement was aborted suddenly, short of making a global history.

Awareness Program and Self Vaccination Initiative: Though the vaccination program was discontinued but the importance of adult Hepatitis B vaccination is now known to everybody and people continued to receive vaccine from commercial canters. The awareness and health education program continued across the state of Tripura.

Prevention of Mother to Child Transmission: Perinatal transmission is one of the commonest routes of Transmission of Hepatitis B. Three important mode of Prevention of transmission are:
1. Screening and treatment of mother if required.
2. At birth Hepatitis B vaccination to the new born.
3. At birth Hepatitis B Immunoglobulin to the new born.

Hepatitis foundation of Tripura is supporting this initiative and instrumental in reducing new infection.

National viral hepatitis control program(NVHCP): The government of India initiated this National program on 28 th July 2018, mainly to diagnose and treat Hepatitis B and C. The program is also a big initiative towards Hepatitis Elimination by 2030,

Liver Clinic of HFT: HFT is running Liver clinic since 2008. The basic purpose of this clinic is to test and treat Hepatitis at affordable cost with counselling of patient and their relatives.

Result [4,5.6]:-

Up to August 2019 Hepatitis Foundation of Tripura, a non government Social organization has vaccinated about 14.2 lacks people in Tripura in its own initiative. The total population covered till August 2019 was almost 37% of total population of Tripura. Another around 5 lacks children (12 % of total Population) has been vaccinated at Govt. level in last ten years. (At Birth Vaccination as a part of Govt Program). It shows that around 50 % population

of Tripura are vaccinated .Around 21 % population are elderly and does not necessarily require vaccination against Hepatitis B. Hence only 29 % of people need active vaccination at this stage. New born children are being vaccinated at birth and subsequently under expanded program of Immunisation with other vaccines. So Tripura is having very high Hepatitis B vaccination rate due to involvement of NGO and public participation. Tripura got the result of all these interventions. According to study in 2012 among hospitalized liver patients Hepatitis B patients were 48.6% but in 2018 it reduced to10.75 %. In another study it was observed that among voluntary healthy blood donors Hepatitis B was 1.59 % in 2005 - 2006, whereas it significantly reduced to 1.02 % in 2017 - 2018. It clearly shows that Tripura is much ahead in achieving the Elimination strategy.

Global Viral Hepatitis Elimination Program: [8]

The WHO has adopted a goal of eliminating HBV infection as a public health threat by 2030, defined as a 90% decrease in incidence and a 65% decrease in mortality compared to 2015 baseline estimates .Using mathematical modelling, the WHO established targets for key interventions identified as sufficient to achieve the elimination goal.

It has been categorically observed that combined efforts of universal vaccination, antiviral treatment , prevention of mother to child transmission and interruption of transmission make elimination of HBV infection plausible and eventually may result in the eradication of HBV. The effort of Hepatitis Foundation of Tripura may be considered as Tripura Model of Hepatitis B Elimination.

Conclusion:-

The mass Hepatitis B vaccination as an initiative of Non Government Social organization is a very good initiative towards hepatitis elimination and success story of public health movements. Political, administrative, community and media support is a must for success of mass health movement. This may act as a template for various health programs. This Tripura model of mass Hepatitis B vaccination to all age groups can be undertaken as template for Hepatitis B elimination in South East Asian countries where Hepatitis B prevalence is Intermediate or high.

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