



# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## Epstein-Bar Virus- Review

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### ABSTRACT

Epstein barr virus infections are very common around globe. They are transmitted through saliva. This virus causes various diseases in human. Infectious mononucleosis, nasopharyngeal carcinoma and burkitt's lymphoma are most common among them. In this review brief description of the virus as well as few diseases with their association are discussed.

**Keywords:** Epstein barr virus, Infectious mononucleosis, Burkitts lymphoma

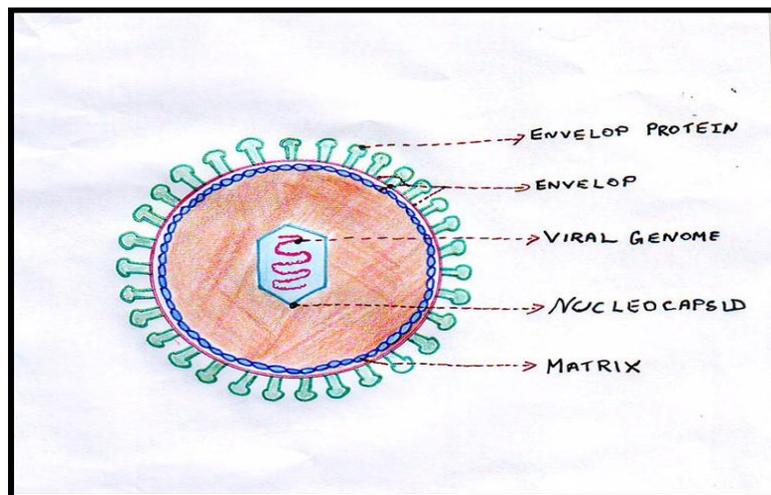
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## INTRODUCTION

Epstein barr virus infections are very common in human. This virus is otherwise known as human herpesvirus 4 (HHV-4). It comes under Herpesvirales order, Herpesviridae family, Gammaherpesvirinae Subfamily and Lymphocryptovirus genus. This virus is made up of Ds DNA. EBV can remain dormant lifelong in human body. It transmits through saliva and vaginal secretions. This virus is best known to cause infectious mononucleosis. Oral hairy leukoplakia, proliferative verrucous leukoplakia, various lymphomas, nasopharyngeal carcinomas are also associated with this virus [2-4,6-9].

## STRUCTURE OF EBV

The diameter of the virus is approximately 120 nm to 180 nm. It is composed of a double helix DNA, which is wrapped in a protein layer, called capsid. The capsid is surrounded by a tegument, which is made of protein. The tegument is surrounded by a lipid envelope. The envelope of the virus contains glycoproteins that play a key role in infection of the host cell.



## EBV and Orofacial diseases

### Infectious mononucleosis

In 1920 Sprunt and Evans described the first case of infectious mononucleosis, which is caused by EBV. Later in the 18th century, fever, pharyngitis, and adenopathy were identified as clinical symptoms of the disease. Children and young adults are most commonly affected by this disease. EBV is transmitted through saliva, hence kissing of a baby was an important mode of transmission of the disease. Later this disease was known as "kissing disease".

### Clinical features

This disease is characterized by fever, cough, headache, chills, sore throat, nausea, and lymphadenopathy with substantial occurrence of splenomegaly and hepatitis.

## **Oral manifestations**

In fact there is no particular oral symptom of this disease, though minor lesions do occur. Acute gingivitis and gingival bleeding, stomatitis, white on grey membrane in some areas, petechia on the palate, oral ulcers are common oral lesions.

## **Proliferative verrucous leukoplakia**

This lesion progress slowly in which number of areas are characteristically affected [1], and the disease has an elevated propensity to persist after treatment and has a high chance malignant transformation and predictable. It is common in males less than 40yrs of age.

It presents verrucous plaque like lesions in the oral cavity. In proliferative Verrucous leukoplakia the tongue is the most common site for malignant Potential [5]

## **Nasophranging Carcinoma(NPC)**

The upper most regions of pharynx (throat) represents the nasopharynx in which incidence of carcinoma is likely to occur. Children and young adults most commonly affected. Incidence in male is quite predominant. Head and neck cancer significantly differs from NPC. This tumour is associated with EBV infection and its anatomical location is very close to lymphoid tissue [7]. Clinical manifestations includes epistaxis, tinnitus and deafness, Headaches and neck bulging.

## **Burkitt 's lymphoma**

This lesion is commonly termed as African jaw lymphoma. It is a B-cell neoplasm. It has two major forms which are of high grade endemic (African) and non-endemic (sporadic) form. They proliferate very rapidly [7].

## **Clinical Features**

The endemic form involves maxilla or mandible. The non-endemic form involves abdominal organs, most commonly distal ileum, caecum or mesentery and less frequently pelvic organs and facial bones are involved. It is of unknown aetiology but often associated with EBV in African form of burkitt's lymphoma.

## **Hodgkin's Lymphoma**

It is one among the two main types of malignant lymphoma worldwide. The pathogenesis of this disease is from EBV infection. About 50% of the cases show EBV positivity. EBV shows positivity in almost 100% cases in HIV associated Hodgkin's disease. HIV patients has higher incidence of Hodgkin's disease when compared with HIV free populations.

Hodgkins lymphoma appear as extremely fluctuating-Painless enlargement of one or more cervical lymph nodes. The overlying skin is normal. In this disease lymph nodes are frequently firm and rubbery in consistency [7].

### **EBV In Oral Squammos Cell Carcinoma(OscC)**

So far EBV viruses does not have significant association with OSCC. Asper few studies Squamous cell carcinoma associated with EBV infection in some geographic area three times compared to other area in Japan [10].

### **EBV in Hairy leukoplakia**

In immuno compremised patients the EBV causes hairy leukoplakia with association of human immunodeficiency virus infection [11].

### **EBV in Warthin's tumour**

By using polymerase chain reaction,EBV is detected in multiple and bilateral warthin'tumour.It has some close association with wathin's tumour [12] EBV in Missleniuos dlseases- E.g ;some autoimmune diseases

### **EBV in systemic Lupus erythematosus**

In certain number of SLE patients EBV establishes persistent infection .The elicited antibodies by the viral antigen EBNA-2,in which SmD1 is cross reacted [13].

### **EBV in Rheumatid arthritis**

It is asystemic autoimmune disease, with the clinical manifestation of disparaging, incapacitating arthritis.EBV persists within B. Lymphocytes for the host's life by stimulating polyclonal lymphocytic expansion, and immune response inhibits by reactivating. By this phenomenon the EBV has close association with Rheumatoid arthritis [14].

### **EBV in multiple sclerosis**

In multiple sclerosis ,for the past four decades the EBV has been repeatedly associated. Abnormal location of EBV infected B.Lymphocytes found in the brain lesion of multiple sclerosis. So there is a close association of EBV in multiple sclerosis [16].

### **EBV in Sjogren's syndrome**

In the genesis of Sjogren's syndrome, EBV plays a role by detection in salivary left gland. Hence EBV has a close association with Sjogren's syndrome [15].



## CONCLUSION

In some cancers the pathogenesis of EBV infection has been concerned. Current data indicates the character of EBV in the epigenetic alterations in several cancers. Counting gastric carcinoma, nasopharyngeal carcinoma and lymphomas. For optimising the diagnostic protocol, further trial should be intended.

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