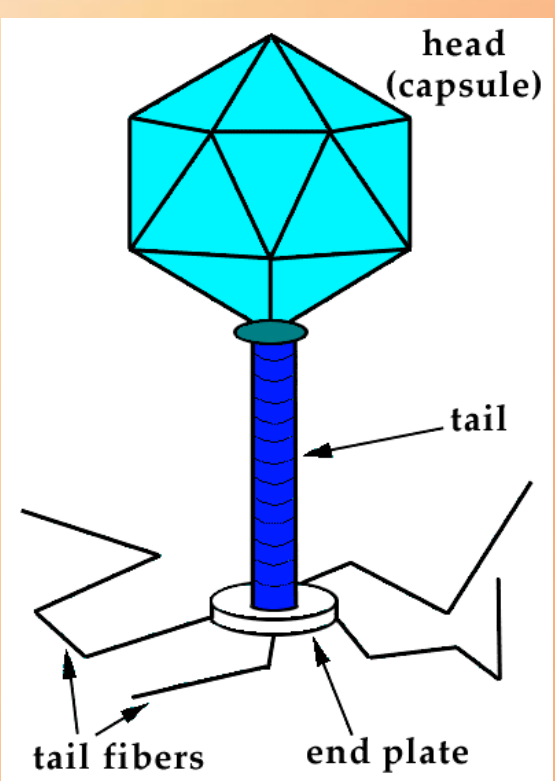
OZONE THERAPY FOR SSPE

Dr. Murat BAS
OZONE CLINIC - BURSA, Turkey

Translation from Turkish: B. Uluvar, Bursa



- SSPE (subacute sclerosing panencephalitis) is one of the rarely seen side effects of the measles disease. It is a slow virus infection in the central nervous system that generally results in death.

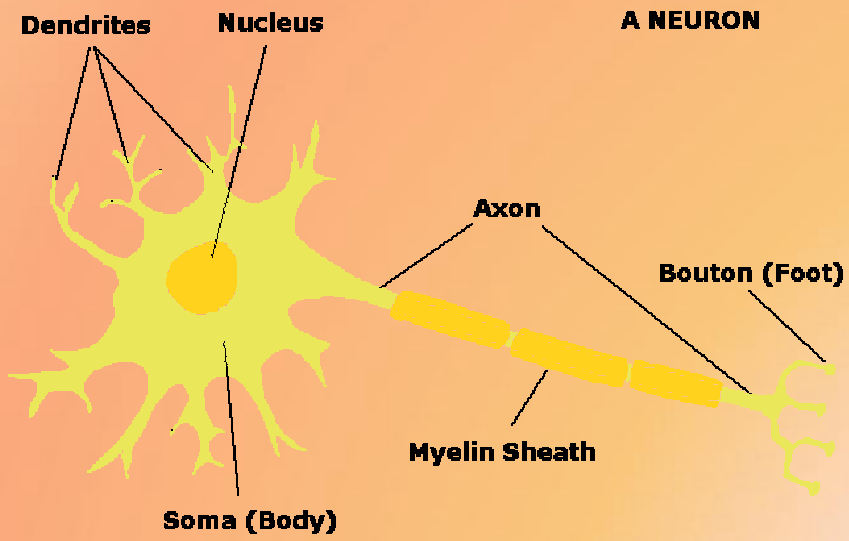
- SSPE can occur anywhere between 2 and 21 years after the measles infection. The disease is usually expressed during childhood, however it can be seen during adolescence or adulthood.
- It is seen approximately 3 times more in boys than girls. Those who have had a measles infection in the first two years of their life are more likely to have SSPE.

- Research has shown that in patients with existing antibodies against the virus before the measles infection the disease SSPE is more likely to occur.
- This means that those who have measles under the age of 2, who have remaining antibodies in their blood from their mother, who are vaccinated too early or who have immuno globulines during the measles infection have a higher chance of developing SSPE.

- It has been proven that it is not the vaccination virus but the actual measles virus that causes SSPE.
- The fact that there are children who had SSPE prior to the measles infection has created the wrong judgement that it is the measles vaccination that causes the disease.
- A measles infection during early childhood might be very subtle and might not be noticed due to the presence of antibodies passed on from the mother. This could cause one to think that the child has not had the measles, and blame the vaccination instead.
- If there were more children left in society without a proper measles vaccination, this would result in more SSPE infections since more children would experience measles, and we could never make the measles disease run off.

- Although SSPE is a lethal disease, there have been cases where it stops without any treatment (5-10 %).
- In the last years, this percentage has been brought up to 20-30% with the aid of supporting therapies.

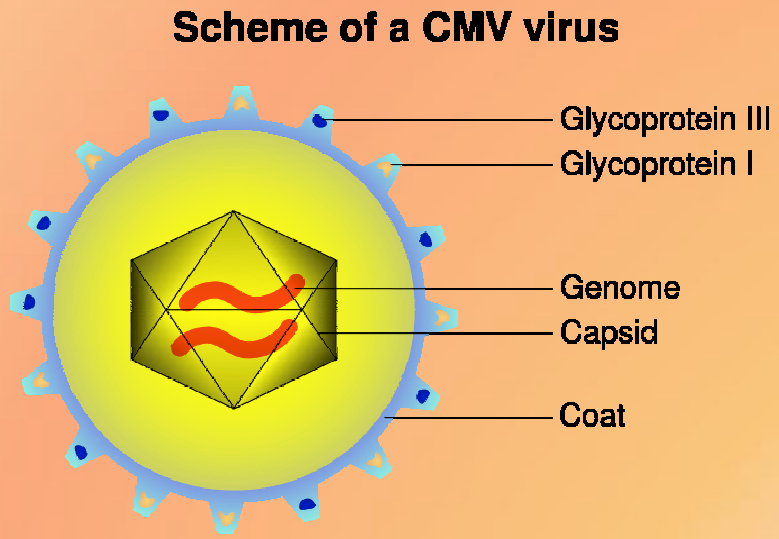
- A long undetermined time after a child has had the measles, the virus that settles in the central nervous system is mutated. There are changes in the virus' structure in the M protein (M), glycoprotein (F) and hemaglutinin (H).
- Because of these changes the virus begins protein synthesis and replication in the brain tissue, first in the neurons' nuclei and then in the dendrites and axon.



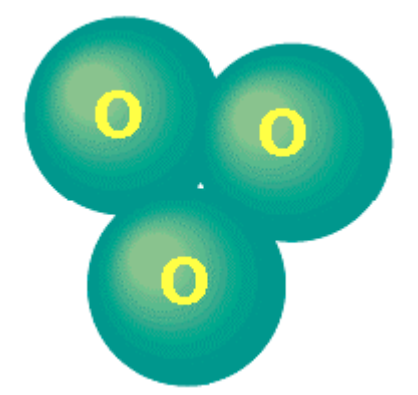
- The replicating viruses begin to damage the neurons and clinical symptoms can be seen at this stage. The disease progresses as more neurons are harmed.

- SSPE therapy includes both symptomatic therapy to reduce the symptoms of the disease, as well as isoprinosine which regulates the immune system, and interferon which prevents virus replication.
- Data as to how effective isoprinosine and interferon are is not available, however it is said that they stop the disease from progressing in some patients.

- The measles virus (rubeola) is an enveloped virus from the Paramyxoviridae family, meaning that it includes RNA and has an outside envelope made of a lipid layer.



- Outside the envelope are hemaglutinin (H) and fusion (F) glycoproteins.
- The H protein's function is to attach to the patient's cell and the F protein is used for penetrating the cell.



- Ozone decreases the number of or destroys these viruses both directly and by producing compounds in the body that will harm the virus.

- All viruses can be destroyed using ozone, but each kind of virus has a varying sensitivity to ozone due to its structure.
- Especially the enveloped viruses are more sensitive, including the rubeola virus.
- While healthy human cells have an enzyme system against oxidation, and therefore are not affected by ozone, viruses are.

- Ozone reacts with the lipid, lipoprotein and glycoproteins on the virus' envelope and harms their structure.

- Ozone has a direct effect on virus particles. Their most sensitive part is the reproductive structures.
- If these particles called virions are destroyed, the virus is killed.
- Also, since infected cells can not produce enzymes against oxidation, they are also sensitive to ozone.
- The virions that are left from infected cells that are killed by ozone can also directly be destroyed by ozone.

- The rubeola virus' H and F proteins will therefore be destroyed by the ozone, and the virus will lose its ability to attach and penetrate the patient's cells.
- The immune system will recognize these viruses which have lost their ability to cause an infection, and the body might develop an autovaccination against these viruses.

- Ozone disrupts the structure of the lipid layer which prevents the virus from attaching to body cells. Ozone breaks it into pieces and the number of viruses in the body decreases.
- The increasing peroxidation in the patient's blood will have an antiviral effect and decrease the virus number.

- Ozone activates the immune system and increases the cytokine production in immune cells.
- Cytokine disrupts the virus' structure and reduces the number of viruses in the circulating blood.
- Ozone increases the interferon level in the body by 400-900%. Interferon is used in the treatment of measles and many other viral infections, including some types of cancer.

- Although ozone can be used for the treatment of all viral infections, it is especially useful for infections caused by enveloped viruses (such as measles) either on its own or with the support of other treatments.

- **IN CONCLUSION, THE EFFECT OF THE OZONE THERAPY IS...**

- Denaturation of the virus
- Disrupting the lipoprotein and glycoprotein structures on the envelope
- The formation of peroxydates that have an antiviral effect
- Significant increase in the interferon and cytokine production in the body
- Strengthening the patient's immune system

These properties of ozone therapy make it a very effective treatment in viral diseases such as measles.

- Ozone also
  - oxidizes all tissues,
  - strengthens the antioxidant system

and therefore lightens the already occurring symptoms of the disease, and either prevents or reduces the effect of secondary symptoms.

- We will soon publish on scientific platforms the early stage data from 3 years of ongoing ozone therapy for SSPE and viral encephalitis in our clinic and other ozone therapy centers.