

Medicine by John Grauerholz, M.D.

Herpes cure has larger implications

If effective treatment has been developed for one set of viruses, then time and research will produce cures for others.

Genital herpes infection, which occupied a great deal of press space a couple of years ago, was eclipsed by the deadlier AIDS (Acquired Immune Deficiency Syndrome). Unlike AIDS, whose cause was only discovered last April, the virus responsible for herpes was well known and research was vectored toward finding a vaccine, or a cure.

At the time the herpes epidemic first came into prominence there was no known cure for any viral disease, in the sense of an antibiotic or chemotherapeutic agent which would kill a virus.

Unlike bacteria, whose existence requires synthesis of proteins and other chemicals, and are thus susceptible to agents which block the production of these necessary chemicals, viruses consist of genetic material, DNA or RNA, coated by a protein produced by the machinery of the infected cell.

So, an antiviral chemical would have to interfere with the reproduction of the genetic material itself. The problem was to find a chemical which would interfere with reproduction of the viral genetic material without interfering with reproduction, or function, of the body's own genetic material.

This problem had been first confronted in the development of anticancer chemicals which interfered with DNA or RNA synthesis in cancer cells. These chemicals affected the genetic material in all rapidly dividing cells, not just cancer cells, and hence had a

number of side effects related to destruction of these normal cells.

In 1982, a drug called acyclovir was found to be effective against herpes viruses. It was initially produced in an ointment form for application to oral and genital sores caused by *herpes simplex* virus, and in an intravenous form for administration to severely ill patients suffering from *herpes encephalitis*. Now, a pill form of the drug is available which is even more effective than the ointment against oral and genital herpes.

Acyclovir is effective against all forms of herpes viruses, which include: herpes simplex I and II, responsible for oral (cold sores) and genital herpes; Varicella-Zoster virus which causes chickenpox and the painful affliction known as shingles; cytomegalovirus, which causes devastating disease in newborns, and a lingering febrile illness in children and adults, and has been implicated in the development of malignant cancers in AIDS victims; and Epstein-Barr virus, which causes mononucleosis and the malignant tumor known as Burkitt's Lymphoma.

If oral acyclovir is effective against just this collection of viruses, it will significantly curtail a major source of morbidity and mortality, both here and in the developing sector.

Cytomegalovirus and Epstein-Barr virus cause chronic, debilitating illnesses associated with immune depression. Cytomegalovirus was once a leading contender as the cause

of AIDS, because of its high incidence in AIDS victims, and is one of the viruses which plague immunosuppressed individuals, such as transplant patients. Epstein-Barr virus, in addition to classic mononucleosis, also has an extended chronic phase in some individuals. This is particularly ominous because of the ability of both these viruses to induce malignant transformation in the immune system.

Chronic infection with both these viruses appears to be increasing and causes decreased energy and stamina in affected individuals, reducing their productivity. Chronic Epstein-Barr virus infection, in particular, produces debilitating fatigue and chronic flu-like symptoms that never completely resolve. These illnesses are generally not severe enough to justify hospitalization and intravenous therapy, and so an effective oral therapy would be a godsend to these people.

Herpes Zoster, or shingles, is an extremely painful eruption of blisters which form on the skin overlying a nerve. In its acute phase, the pain can be incapacitating.

As useful as treatment of these conditions themselves would be, the ability to develop an effective agent against one group of viruses indicates that an active research program would result in effective drugs against other viruses. It is this potential which must be realized to deal with the growing threat of pandemics, such as influenza. Once an epidemic has started, immunization does nothing for those already affected and in some cases effective vaccines do not exist.

To make the point clearer, while we presently lack effective vaccines against herpes viruses, we now have an effective treatment. Similar situations may occur with other diseases, such as AIDS and the common cold. Only time, and active research, will tell.