How Does Kutapressin™ Work?

Virucidal?

EBV

Improvement in chronic fatigue syndrome with elevated EBV EA by Kutapressin™, an injectable liver extract with in vitro anti-EBV activity Thomas Steinbach MD, Carl Lawyer MD, William Hermann MD, David Montefiore PhD, Earl Kern MD, Ali Gawish PhD, Sudahar Wagle PhD, David Ferguson MD

126 (=79%) of 16 patients having a syndrome of chronic fatigue for at least 4 months associated with Epstein Barr virus (EBV) reactivation including significantly elevated EBV-early antigen IgG titers ≥ 1:80 showed significant or marked clinical improvement with Kutapressin™, a porcine liver extract, 2 cc intramuscularly daily for 10 days followed by three times a week for an average of 33 injections. Kutapressin™ had been used in patients in the United States in 2 cc IM injections for indications including herpes zoster (shingles) since 1940 without reports of significant toxicity [PDR]. In vitro testing showed a fraction of Kutapressin™ at 1.5 ug/ml blocked 50% of EBV early antigen induction in Raji cells by P3HR1 infection with 2 ug/ml of acyclovir required to produce a similar effect. Conclusion: Kutapressin™ contains a fraction with in vitro anti-EBV activity and appeared to produce clinical benefit in most chronic fatigue syndrome patients.

HHV-6

Kutapressin Inhibits *In Vitro* Infection of Human Herpesvirus-6

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Introduction & Objection: Kutapressin has been used in the treatment of herpes zoster, keloids, seborrhea, other skin diseases and neurasthenia (Marshall, W Mississippi Valley Med J 61:172, 1939; Marshall, W and Schadeberg, WA Wisconsin Med J 49:369, 1950; Barksdale, E *et al.* Virginia Med Monthly 81:321, 1954). More recently, uncontrolled studies have claimed that Kutapressin treatment improves the symptoms of many patients with Chronic Fatigue Syndrome (CFS) (Steinbach & Hermann personal communication). One large study found evidence of the reactivation of HHV-6 in many patients with CFS (Buchwald, D *et al.* Ann Int Med 116:103, 1992). Moreover, HHV-6 DNA was detected in the lymph nodes of CFS patients by Southern plot analysis (Josephs, SF *et al.* Lancet 337:1346, 1991). Because of the possible positive clinical effects of Kutapressin in patients with CFS and the evidence that CFS is associated with the reactivation of HHV-6, we investigated the possibility that Kutapressin might have direct anti viral activity against HHV-6.

METHODS:Kutapressin (Schwarz Pharma, Mequon, WI) free of Phenol was dissolved in tissue culture medium (RPMI-1640, containing 10% FCS and antibiotics) for *in vitro* studies. A human T-lymphocyte cell line (HSB_2) was used to infect with HHV-6.

RESULTS: The most effective dose of Kutapressin which blocked HHV-6 [GS strain, belonging to the type A group (Ablashi, DV *et al.* Virology 184:545, 1991)] infection of HSB_2 cells (Ablashi, DV *et al.* Nature 329:207, 1987) were 300 and 500 ug/ml. These doses of the drug were not toxic to the cells. The most effective inhibition of HHV-6 infection (1000 $TCID_{50}$) was evident when cells ($\geq 1x10^6$/ml) were pretreated with Kutapressin overnight, prior to viral infection, and then post infection, were kept in the presence of Kutapressin (>95%) throughout the experiment (14 days post infection). Also, >80% inhibition of HHV-6 infection was observed with 300 and 500 ug/ml doses of the drug when HSB_2 cells were first infected with 1000 $TCID_{50}$ of HHV-6 and were then maintained in the presence of Kutapressin. Thirdly, when Kutapressin is a potent inhibitor of HHV-6 infection. The mechanism of HHV-6 inhibition by Kutapressin is under investigation.