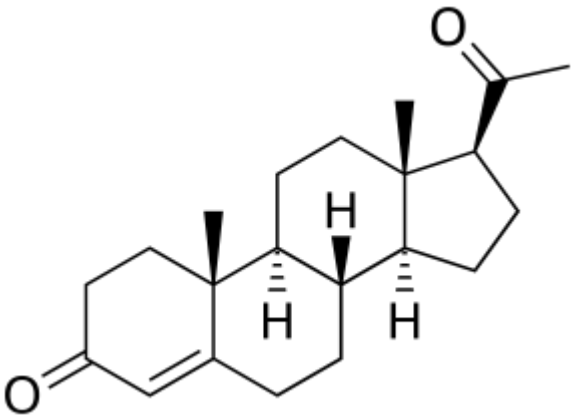
Progesterone



see also Progesterone receptor.

(pregn-4-ene-3,20-dione; abbreviated as P4) is an endogenous steroid hormone involved in the menstrual cycle, pregnancy, and embryogenesis of humans and other species.

It belongs to a group of steroid hormones called the progestogens, and is the major progestogen in the body. Progesterone is also a crucial metabolic intermediate in the production other endogenous steroids, including the sex hormones and the corticosteroids, and plays an important role in brain function as a neurosteroid.

Dexamethasone (DEXA) is widely used in the management of peritumoral edema. DEXA, however, has many systemic side-effects, and may interact negatively with glioma therapy. Progesterone (PROG), on the other hand, is a well-tolerated and readily accessible antiinflammatory and anti-edema agent with potent neuroprotective properties.

Cheng et al., investigated if PROG can serve as a viable alternative to DEXA in the management of peri-tumoral brain edema.

They used an orthotopic C6 glioblastoma model with male Sprague Dawley rats. Tumor grafts were allowed to grow for 14 days prior to drug treatment with (i) DEXA 1mg/kg, (ii) PROG 10mg/kg or (iii) PROG 20 mg/kg for five consecutive days. Overall animal survival and neurologic functions were evaluated. Mechanistic studies on blood brain barrier (BBB) permeability and angiogenic responses were performed on the ex vivo tumor grafts.

They found that all drug treatments prolonged overall survival to different extents. PROG 10mg led to significantly longer survival, and better preservation of neurologic functions and body weight. BBB permeability was better preserved with PROG 10mg than DEXA possibly through the downregulation of MMP-9 and AQP-4 expressions; anti-angiogenic responses were also observed in the PROG group.

This proof-of-concept pilot study provides novel information on the use of PROG as a corticosteroids-sparing agent in brain tumor management. Further translational and clinical studies are warranted [1)].

Progesterone for acute traumatic brain injury

see Progesterone for acute traumatic brain injury.

1)
Cheng Y, Yeung WL, De Zhang P, Li N, Kiang MY, Leung KK. Progesterone is more effective than dexamethasone in prolonging overall survival and preserving neurologic functions in experimental animals with orthotopic glioblastoma allografts. World Neurosurg. 2019 Jan 30. pii: S1878-8750(19)30211-6. doi: 10.1016/j.wneu.2019.01.113. [Epub ahead of print] PubMed PMID: 30710720.