

Distribusi Reseptor Virus Influenza A Asam Sialat α 2,3(SA α 2,3)Gal dan α 2,6(SA α 2,6)Gal di Mukosa Olfaktori dan Bulbus Olfaktorius Tikus Berbagai Umur

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INTISARI

Latar belakang: Asam sialat membran plasma SA α 2,3Gal merupakan reseptor virus avian influenza (AI) sedangkan virus *human influenza* spesifik berikatan dengan SA α 2,6Gal. Virus AI ditemukan pada otak manusia terinfeksi AI namun jalur infeksiya masih belum diketahui.

Tujuan: Penelitian ini bertujuan mengetahui distribusi reseptor virus AI (SA α 2,3Gal) di mukosa olfaktori dan bulbus olfaktorius tikus Wistar berbagai umur betina maupun jantan.

Metode: Sediaan histologikkepala tikus Wistar betina maupun jantan umur 10 (muda), 60 dan 120 (dewasa), 240, dan 360 (tua) hari yang didekalsifikasi dipotong semiserial pada cavum nasi dan bulbus olfaktorius diwarnai dengan lektin dankromogen 3,3'-diaminobenzidine (DAB). Lektin *Maackia amurensis agglutinin* (MAA) digunakan untuk mendeteksi SA α 2,3Gal dan *Sambucus nigra agglutinin* (SNA) untuk mendeteksi SA α 2,6Gal. Semikuantitatif intensitas reaksi pewarnaan masing-masing lektin dilaporkan sebagai rerata skor dan dianalisa secara deskriptif.

Hasil : Reseptor SA α 2,3Gal memenuhi berbagi area yang diamati pada mukosa olfaktori tikus secara umum dibanding reseptor SA α 2,6Gal. Reaksi positif pewarnaan ditemukan paling dominan pada silia bahkan lebih kuat dibandingkan reaksi pewarnaan di endotel dan epitel respiratori. Intensitas pewarnaan paling kuat (++++, sangat kuat) ditemukan pada reseptor SA α 2,3Gal di mukosa olfaktori tikus muda (10 hari). Bulbus olfaktorius didominasi reseptor SA α 2,6Gal di badan sel saraf, sedangkan reseptor SA α 2,3Gal terdistribusi di serabut saraf terutama di lapisan glomerular dan subependimal, tempat sinaps saraf reseptor olfaktori.

Kesimpulan: Distribusi reseptor SA α 2,3Gal pada silia mukosa olfaktori dan bulbus olfaktorius mengindikasikan adanya jalur infeksi AI melalui jalur olfaktori ke otak, terutama pada individu muda.

Kata kunci: Avian influenza, SA α 2,3Gal, SA α 2,6Gal, silia, mukosa olfaktori, bulbus olfaktorius

Distribution of Influenza Virus Receptors SA α 2,3Gal and SA α 2,6Gal in Rat Nasal Cavity and Olfactory Bulb

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ABSTRACT

Background: Avian influenza (AI) viral infection is observed in the brain of human patients and animal model especially in olfactory bulb at early stage of infection, suggesting that direct route of viral transmission via olfactory nerves may exist. To initiate the infection, AI virus specifically recognizes membrane sialic acid (SA) α 2,3Gal, while human influenza virus specifically recognizes SA α 2,6Gal receptor. The distribution of these two receptor types has never been investigated in rat olfactory mucosa and olfactory bulb.

Objective: Objective of this research is to investigate the distribution of SA α 2,3Gal and SA α 2,6Gal receptors by lectin histochemistry in rat olfactory mucosa and olfactory bulb at various age.

Methods: Paraffin embedded tissue of decalcified Wistar rat cranium age P10, P60, P120, P240, and P360 were sectioned semiserially. Tissue sections were blocked with avidin-biotin-peroxidase complex then incubated with biotinylated MAA and SNA lectin and labeled with 3,3'-diaminobenzidine tetrahydrochloride (DAB) and counterstained with Hematoxylin. Lectin incubation was omitted in sections used as negative control.

Result & Discussion: Both types of receptor were present in the olfactory mucosa of rat predominantly in the apical surface of epithelium especially in the cilia. Compared to SNA staining, higher intensity of MAA staining was observed suggesting that rat olfactory mucosa express more SA α 2,3Gal receptors. The staining intensity was also higher in P10 rat compared to older rats, that may explain many reports of AI viral infection in children's brain. The pattern of SNA staining differed with MAA staining in the olfactory bulb, i.e. MAA staining dominantly stained the nerve fibers while SNA staining was observed in the neuronal cell bodies. Both were present in the synaptic area of olfactory nerves order I to order II.

Conclusion: The distribution of AI receptor SA α 2,3Gal in the olfactory mucosa and olfactory bulb indicates the existence of olfactory route of AI viral infection.

Key word: Avian influenza, SA α 2,3Gal, SA α 2,6Gal, olfactory mucosa, olfactory bulb