PENDERITA INFEKSI SALURAN PERNAPASAN AKUT ANAK DENGAN EKSPRESI PROTEIN *MYXOVIRUS RESISTANCE-A* (MxA)

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INTISARI

Latar Belakang: Infeksi saluran pernapasan akut (ISPA) merupakan salah satu dari 10 penyakit tersering diderita anak. Lebih dari 60% penyebab ISPA diduga virus. Diagnosis infeksi virus pada ISPA menjadi tantangan tersendiri, di mana infeksi bakteri dan pathogen lain sering memberikan gejala klinis yang serupa. Protein *Myxovirus resistance-A* (MxA) yang terinduksi oleh interferon tipe I secara selektif karena infeksi virus menjadi salah satu pilihan pemeriksaan yang spesifik untuk ISPA karena virus. Aktivasi interferon ditengarai dipengaruhi oleh kadar vitamin A dan zink yang diketahui berperan dalam modulasi sistem imun, sehingga dihipotesiskan bahwa pada anak dengan defisiensi vitamin A dan zink, ekspresi protein MxA akan lebih rendah apabila anak menderita ISPA karena virus.
Tujuan: Untuk membandingkan kadar ekspresi protein MxA pada anak penderita ISPA yang menderita defisiensi vitamin A dan zink dengan anak penderita ISPA tanpa defisiensi.
Metode: Studi ini menggunakan desain potong lintang. Pada subyek berusia 2-11 tahun yang terdiagnosis menderita ISPA oleh karena infeksi virus berdasar skor klinis tervalidasi dan memenuhi kriteria inklusi, dilakukan pengambilan sampel darah untuk pemeriksaan vitamin A (metode AAS), zink plasma (metode HPLC), protein MxA (Western Blotting). Kultur darah dan RT-PCR virus dari swab nasofaringeal dikerjakan untuk konfirmasi diagnosis. Subyek dikelompokkan ke dalam kelompok defisiensi vitamin A dan zink serta kelompok non-defisiensi untuk kemudian dianalisis perbedaan ekspresi protein MxA, dan luaran derajat klinis.
Hasil: Sebanyak 26 subyek berpartisipasi dalam penelitian ini, diklasifikasikan ke dalam kelompok defisiensi vitamin A dan zink (9 subyek) dan kelompok non-defisiensi (15 subyek). Dua subyek di-eksklusi karena kegagalan pengambilan darah. Karakteristik dasar subyek dan luaran klinis akhir di antara kedua kelompok tidak berbeda secara nyata. Pemeriksaan protein MxA pada kelompok defisiensi menunjukkan hasil lebih rendah seara signifikan (rerata 2,12: SD$\pm$0,21) dibandingkan dengan kelompok non-defisiensi (rerata 2,51; SD$\pm$0,22) (p =0,07 dengan IK85-90%). Sebanyak 3 subyek dari kelompok non-defisiensi ter-*drop out* karena didapatkan hasil kultur darah positif infeksi bakteri dan menunjukkan ekspresi protein MxA hanya sebesar 0,48 ($\pm$0,37). Pemeriksaan PCR virus belum dapat dilakukan karena kendala waktu.
Kesimpulan: Ekspresi protein MxA pada anak penderita ISPA dengan defisiensi vitamin A dan zink ditemukan lebih rendah secara signifikan dibandingkan dengan anak penderita ISPA tanpa defisiensi. Penelitian lanjutan dengan jumlah subyek lebih besar dan desain pre-post perlakuan diperlukan untuk mengklarifikasi hasil.

Kata kunci: ISPA, vitamin A, zink, protein MxA, infeksi virus

ASSOCIATION OF CHILDREN WITH ACUTE RESPIRATORY TRACT INFECTION TO THE EXPRESSION OF *MYXOVIRUS RESISTANCE-A* (MxA) PROTEIN

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ABSTRACT

Background: Respiratory tract infection (RTI) takes one of top 10 most common disease of children in Indonesia. More than 60% RTI is caused by viral infection. Establishing viral infection in RTI has become major challenge, as bacterial and another pathogen infection deliver similar clinical manifestations. *Myxovirus resistance-A* (MxA) protein, which selectively induced by activation of type I interferon due to viral infection has become a potential candidate for specific biomarker to diagnose viral-caused RTI. On the other hand, interferon activation has been suggested to be influenced by plasma vitamin A and zinc, thus hypothesize that children with vitamin A and zinc deficiencies should have lower expression of Protein MxA when they suffer from virus-caused RTI.

Purpose: To compare the protein MxA expression level on children with vitamin A and zinc deficiencies when they suffered from viral-caused RTI to the children with no deficiency.

Methods: Cross-sectional design was used. Subjects with age of 2-11 years old, diagnosed of having RTI due to viral infection on the basis of validated clinical score were included. Blood samples were taken for vitamin A examination (AAS), plasma zinc (HPLC), and MxA protein (Western Blotting). Blood culture and RT-PCR of virus from nasopharyngeal swab were planned to be performed to confirm the diagnosis. Subjects were grouped into deficiency group and non-deficiency group. Then, MxA protein expression and clinical outcome in each group were analyzed, respectively.

Result: Twenty six subjects were included in this study. On the basis of vitamin A and zinc examination, subjects were clustered into vitamin A and zinc deficiencies group (9 subjects) and non-deficiency group (15 subjects). Two subjects were excluded due to failure in blood-drawing. Basic characteristics and clinical outcome on both group were not significantly different. MxA protein examination on deficiency group showed a lower expression (2,12; SD$\pm$0,21) compared to non-deficiency group (2,51; SD$\pm$0,22) (p =0,07 with CI 85-90%). Three subjects of non-deficiency group were dropped out in the later as blood-culture examination showed positive bacterial infection. Their MxA examination showed a low expression (0,48; SD$\pm$0,37), supporting non-viral infected RTI. RT-PCR examination were not finished yet due to time constraint.

Conclusion: MxA protein expression has been found lower in children with vitamin A and zinc deficiencies compared to children with no deficiency, in which both suffering from viral-caused RTI. Further analyses using bigger number of subjects and pre- post-treatment design is strongly suggested to clarify the result of this study.

Keywords: Respiratory tract infection (RTI), vitamin A, zink, MxA protein, viral infection