Heat shock proteins of *S. typhi* and their reactivity with sera from patients with Typhoid fever

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Abstrak

Kami mempelajari respon Heat Shock Protein *(HSP)* Salmonella typhi *setelah dipaparkan pada peningkatan suhu pertumbuhan. Tiga protein utama dengan berat molekul 58, 68 dan 88 KDa diekspresikan berlebihan ketika sel* S. typhi *dipindahkan dari 37°C ke 45°C dan 55°C. Protein tersebut juga diekspresi pada 37°C. Studi Western blot dan immunopresipitasi dengan antibodi monoklonal anti HSP mengungkapkan bahwa protein 58 dan 68 KDa adalah sama dengan protein* GroEL *dan* DnaK E. coli. *HSP ini juga ada banyak sekali dalam fraksi membran luar sel dan dalam jumlah yang lebih kecil pada sitoplasma. Percobaan immunoblot menggunakan serum pasien demam tifoid dengan kultur positif memperlihatkan adanya antibodi terhadap HSP tersebut. Sembilan dari 12 serum terlihat bereaksi terhadap protein 58, 68 dan 88 kDa, sementara 3 serum bereaksi hanya terhadap protein 68 dan 88 KDa. Semua serum dari 10 individu normal dan sehat tidak terlihat bereaksi dengan HSP tersebut. Tiga dari 4 daerah imunodominan dalam gen* GroEL S. typhi. *juga telah diidentifikasi menggunakan peptida sintetik pada* polyethylene pins. *Berdasarkan data yang telah diketahui mengenai peran HSP dalam patogenesis infeksi mikroba dan sebagai antigen imunodominan, penemuan ini mungkin menunjang untuk mengerti lebih baik proses penyakit, serta pengembangan alat diagnosis dan strategi pencegahan dimasa depan.*

Abstract

We studied the heat shock protein (HSP) response of Salmonella typhi *following exposure to elevated growth temperatures. Three major proteins with molecular sizes of 58, 68 and 88 kDa were abundantly expressed when* S. typhi *cells were shifted from 37°C to 45°C and 55°C. These proteins were also consitutively expressed at 37°C. Western blotting and immunoprecipitation studies with anti-HSP monoclonal antibodies, revealed that the 58 and 68 kDa proteins were analogous to the* GroEL *and* DnaK *proteins of* E. coli. *These HSPs are also abundantly present in the outer membrane fraction of disrupted cells and, to a lesser extent, in the cytosol. Immunoblotting experiments with sera from patients with a culture-positive diagnosis of typhoid fever showed the presence of antibodies to these HSPs. Nine out of twelve sera reacted with the 58, 68 and 88 kDa proteins, while three sera only with the 68 and 88 kDa proteins. All ten sera from normal, healthy individuals showed no binding to these HSPs. Three to four immunodominant regions within the* S. typhi GroEL *gene was also identified using peptide synthesis on polyethylene pins. In light of the well-documented roles of HPSs in the pathogenesis of microbial infections and as immunodominant antigens, these findings may be relevant for a better understanding of disease processes and future development of diagnostic and preventive strategies.*

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