

RINGKASAN

Perubahan Respons Psikoneuroimunologis Pada Pelaksana Puasa Ramadan

Studi kasus di Pesantren Hidayatullah Surabaya dengan Pendekatan Psikoneuroimunologi

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Puasa Ramadan dilaksanakan setiap tahun, yang diperintahkan bagi orang beriman agar bertakwa. Puasa yang dilandasi dengan iman akan mendatangkan ketenangan (QS. 13; 28). Puasa dapat menyehatkan (Hadist Thabrani). Puasa Ramadan sangat aman untuk orang dewasa sehat (Nagra, 1998). Namun dalam kenyataan terdapat pelaksana puasa Ramadan (PPR) yang menunjukkan keberhasilan, sementara sebagian lain mengalami sakit. Hal ini menunjukkan heterogenitas persepsi PPR terhadap puasa Ramadan, sehingga mengakibatkan respons yang beragam. Fakta tersebut belum dapat dijelaskan dan masih merupakan masalah penelitian ini.

Tujuan penelitian ini ialah untuk menjelaskan perubahan respons psikoneuroimunologis PPR selama berpuasa Ramadan. Untuk memenuhi tujuan tersebut penelitian ini menggunakan paradigma psikoneuroimunologi dengan jenis penelitian observasional analitik. Sampel 13 orang yang merupakan *total population* diambil dari mahasiswa Sekolah Tinggi Agama Islam Lukman al Hakim Pesantren Hidayatullah Surabaya pada bulan Ramadan tahun 2003, yang memenuhi kriteria inklusi dan eksklusi.

Variabel penelitian ini adalah perubahan respons psikoneuroimunologis (imunitas) yang diwakili neutrofil, limfosit, monosit, IgG serta kortisol. Dosis berpuasa Ramadan adalah berpuasa siang hari mulai terbit fajar sampai terbenam matahari, dilaksanakan setiap hari selama 26 hari. Selama berpuasa mengerjakan salat tarawih dan mengkaji al-Qur'an 1-2 kali setiap hari. Variabel kendali: waktu bersahur, makan di pondok pesantren, aktivitas bepergian hanya dalam kota. Pengambilan unit analisis darah dilakukan secara bertahap, dan dilakukan setiap jam 07.00-09.00 WIB pada setiap tahap. Pengambilan pertama dilakukan 3 minggu sebelum responden melaksanakan puasa. Pengambilan kedua dilakukan setelah responden berpuasa 5 hari. Pengambilan ketiga dilakukan setelah responden berpuasa 16 hari. Pengambilan keempat dilakukan setelah responden berpuasa 26 hari, hari terakhir responden berada di pesantren.

Hasil uji beda respons psikoneuroimunologis sebelum berpuasa dengan tahap pertama 5 hari puasa, menunjukkan terdapat peningkatan bermakna pada kadar kortisol, kadar IgG, jumlah monosit dan penurunan jumlah neutrofil ($p < 0,05$). peningkatan kortisol dalam rentang fisiologis diduga memicu peningkatan IgG, menstimulasi pemicuan proliferasi monosit, sedangkan pada neutrofil menyebabkan hambatan proliferasi, karena neutrofil lebih peka terhadap peningkatan kadar kortisol.

Hasil uji beda respons psikoneuroimunologis sebelum berpuasa dengan tahap berpuasa 16 hari, menunjukkan terdapat peningkatan bermakna pada kadar kortisol, jumlah neutrofil dan jumlah monosit, penurunan bermakna kadar IgG ($p < 0,05$). Pada tahap berpuasa tersebut diduga terjadi perubahan predominasi sel Th ke arah kearah Th-1, sehingga meningkatkan produksi IL-2 dan terjadi penurunan produksi IL-4, sehingga mendorong penurunan kadar IgG, juga dapat disebabkan penekanan secara selektif sel B yang tidak efisien dalam memproduksi IgG oleh kortisol menurun. Peningkatan jumlah neutrofil pada kadar kortisol tersebut, disebabkan pada kondisi tersebut kortisol sudah cukup untuk memicu proliferasi neutrofil dan monosit. Hasil uji beda respons psikoneuroimunologis sebelum berpuasa dengan tahap berpuasa 26 hari, menunjukkan terdapat peningkatan bermakna pada kadar kortisol, jumlah neutrofil, jumlah limfosit, jumlah monosit dan penurunan bermakna kadar IgG ($p < 0,05$). Semua perubahan variabel tersebut berada dalam rentang fisiologis. Pada tahap berpuasa 26 hari juga diduga terjadi perubahan predominasi sel Th kearah kearah Th-1, yang selanjutnya mendorong penurunan kadar IgG. Peningkatan limfosit dapat terjadi melalui peningkatan proliferasi limfosit karena peningkatan induksi ekspresi IL-2R α . Diduga hal demikian juga terjadi pada monosit dan neutrofil. Peningkatan kortisol tersebut juga menurunkan migrasi dan meningkatkan jumlah neutrofil disirkulasi serta menghambat apoptosis.

Kesimpulan dari hasil penelitian ini adalah: pertama; respons psikoneuroimunologis selama berpuasa menunjukkan hasil yang variatif dan pada umumnya dalam rentang fisiologis. Kedua; pada tahap berpuasa 5 hari terjadi perubahan respons psikoneuroimunologis yang dicerminkan peningkatan kadar kortisol, kadar IgG, jumlah monosit dan penurunan neutrofil. Pada tahap berpuasa 16 hari terjadi peningkatan kadar kortisol jumlah neutrofil dan jumlah monosit, serta penurunan kadar IgG. Pada tahap berpuasa 26 hari terjadi peningkatan kadar kortisol, jumlah neutrofil, jumlah limfosit dan monosit serta penurunan IgG. Respons psikoneuroimunologis PPR selama berpuasa tersebut sudah mencapai tahap adaptasi. Ketiga; perubahan respons psikoneuroimunologis PPR terjadi karena perubahan irama sirkadian dan perubahan irama sirkadian tersebut secara umum tidak berdampak patologis.

SUMMARY

Psychoneuroimmunological Response Change in Ramadan Fasting Individuals

A Case Study in Pesantren Hidayatullah Surabaya using Psychoneuroimmunological Approach

Achmad Zainullah

Ramadan fasting is conducted each year, as had been ordered to those who believe to reach *taqwa*. Fasting based on true belief may bring about peacefulness (QS 13 : 28) and it may also improve health (Hadits Thabrani). It is safe for healthy adult individuals (Nagra, 1998). However, in reality, some of the fasting individuals succeed in attaining those achievements, while some others even suffer from diseases. This indicates heterogeneous perception of those individuals on Ramadan fasting, which results in different responses. This fact remains unexplainable and, therefore, it was questioned in this study.

The objective of this study was to explain the change of psychoneuroimmunological response among individuals conducting Ramadan fasting. This study used psychoneuroimmunological paradigm with analytic observational design. Samples, comprising 13 individuals who served also as total population, were taken during Ramadan 2003 from the students of Sekolah Tinggi Agama Islam Lukman al Hakim, Pesantren Hidayatullah, Surabaya, who met the inclusion and exclusion criteria.

The variables of this study were psychoneuroimmunological change (immunity) represented by neutrophil, lymphocyte, monocyte, IgG and cortisol. The dose of fasting was during the day, from dawn to sunset, conducted every day for 26 days. During fasting, they also conducted *shalat tarawih* and studying al-Qur'an once or twice a day. The control variables were time of *sahur*, having meal in pesantren, and traveling activity was only conducted in town. Blood, as unit analysis, was collected in stages, carried out from 07.00 - 09.00 a.m. in each stage. The first collection was done three weeks before fasting, The second, third, and fourth collection were taken after 5, 16, and 26 days, respectively.

The results of discriminant test on psychoneuroimmunological response before fasting and day 5 fasting revealed significant increase in cortisol, IgG, and monocyte, and reduction of neutrophil counts ($p < 0.05$). The cortisol increase within physiological range was suggested to trigger IgG increase and stimulated monocyte proliferation, while in the neutrophil it resulted in proliferation inhibition, because it was more sensitive to the increase of cortisol level. The results of discriminant test on psychoneuroimmunological response before fasting and day 16 fasting showed significant increase in cortisol, neutrophil, and monocyte, as well as significant reduction of IgG ($p < 0.05$). In this stage, it was suggested that there was a change from Th predominance to Th-1 predominance, resulting in increased production of IL-2 and reduced production of IL-4, leading to the decrease of IgG. It could also

result from selective suppression of B cells, which was insufficient to produce IgG. Increased neutrophil count in such cortisol level was because in such condition the cortisol has been sufficient to trigger neutrophil and monocyte proliferation. The results of discriminant test on psychoneuroimmunological response before fasting and day 26 showed significant increase in cortisol level, neutrophil, lymphocyte, monocyte, and reduced IgG level ($p < 0.05$). All of those variables was at physiological range. In day 26 fasting, there was a change of the predominance of Th to Th-1, which subsequently lead to the reduction of IgG level. Increased lymphocyte level could result from the increase of lymphocyte proliferation resulting from the increased induction of IL-2R alpha expression. This could also occurred in neutrophil and monocyte. The increased cortisol also reduced neutrophil migration, increased neutrophil in circulation and inhibited apoptosis.

In conclusion, first, psychoneuroimmunological response change during fasting showed varied results and generally within physiological range. Second, in day 5 fasting psychoneuroimmunological response changed as reflected by the increase of cortisol, IgG, and monocyte and the decrease of neutrophil. In day 16 fasting cortisol, neutrophil, and monocyte increased, while monocyte and IgG reduced. In day 26 fasting cortisol, neutrophil, lymphocyte, and monocyte increased, while IgG reduced. Psychoneuroimmunological response in fasting individuals has reached adaptation stage. The third, the change psychoneuroimmunological response resulting from the change of circadian rhythm and the change of circadian rhythm has no pathological effects.



ABSTRACT**Psychoneuroimmunological Response Change in
Ramadan Fasting Individuals****A Case Study in Pesantren Hidayatullah Surabaya
using Psychoneuroimmunological Approach****Achmad Zainullah**

The objective of this study was to explain the change of psychoneuroimmunological response among individuals conducting Ramadan fasting. This study used psychoneuroimmunological paradigm, and according to ethical consideration, this study did not involve control. Therefore, this study used analytic observational method using serial examination. Samples were taken from the students of Sekolah Tinggi Agama Islam Lukman al Hakim, Pesantren Hidayatullah, Surabaya, during Ramadan 2003. As the students who met the inclusion and exclusion criteria were only 13 individuals, all were taken as samples, presenting as total population.

The variables of this study were psychoneuroimmunological change (immunity) represented by neutrophil, lymphocyte, monocyte, IgG and cortisol. The dose of fasting was during the day, from dawn to sunset, conducted every day for 26 days. During fasting, they also conducted *shalat tarawih* and studying al-Qur'an once or twice a day. The control variables were time of *sahur*, having meal in pesantren, and traveling activity was only conducted in town. Blood, as unit analysis, was collected in stages, carried out from 07.00 - 09.00 a.m. in each stage. The first collection was done three weeks before fasting, The second, third, and fourth collection were taken after 5, 16, and 26 days, the last time they were in boarding house. Results analysis of psychoneuroimmunological response in day 5 fasting was found to have significant difference ($p < 0.05$) from that before fasting. Cortisol, IgG, and monocyte increased and neutrophil count decreased. The response in day 16 also had significant difference ($p < 0.05$) from that before fasting. Cortisol level, neutrophil, and monocyte count increased, while IgG level decreased. Psychoneuroimmunological response in day 25 fasting had no difference ($p > 0.05$) from that before fasting. Cortisol level, neutrophil, lymphocyte, and monocyte count increased, while IgG level decreased.

As conclusions, first, the change of psychoneuroimmunological response in day 5, 16, and 26 indicated variative result and generally within physiological range. Second, in day 5 fasting cortisol, IgG level, monocyte count increased and neutrophil count decreased. In day 16 fasting, cortisol level, neutrophil, monocyte count increased while IgG level decreased. In day 26 fasting, cortisol level, neutrophil, lymphocyte, and monocyte count increased while IgG level decreased. Psychoneuroimmunological response in Ramadan fasting individuals during Ramadan fasting has reached adaptation stage.