



Changes in self-rated health mirrors changes in cytokines and sickness behavior after endotoxin stimulation

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Background

We have previously shown that acute inflammatory response causes robust alterations of state and trait dimensions of self-rated health. Here, we repeat the previous study using a higher dose of endotoxin and investigate consequences of inflammation that may mediate changes in health appraisal.

Procedure

- 22 healthy subjects
- injected with lipopolysaccharide (2.0 ng/kg) and placebo
- within-subject design (minimum 20 days between sessions)

Assessments

- Before, 3 h after and 7 h after injection.
- Self-rated current health: “How is your health right now?” Excellent (1) – Very poor (7)
- Self-rated general health: “How would you rate your general state of health” Very good (1) – Very poor (5)
- Sickness behavior: Sickness Questionnaire (*Andreasson et al. 2016*)
- Cytokines: interleukin (IL)-6, IL-8 and TNF-alpha (ELISA)

Statistics

1. Effect of injection on state and trait self-rated health was tested in a mixed effect regression analysis.
2. Associations between relative changes in cytokines, change in sickness behavior with changes in self-rated health were investigated, including change between baseline and 3 hours, and between 3 and 7 hours, in a mixed effect regression analysis.

Effect of LPS infection on subjective health perception

Self-rated general health	b	95% Confidence interval	p
Time 1 (3 h vs baseline)	.18	-.07 - .43	0.16
Time 2 (7 h vs baseline)	.14	-.13 - .40	0.32
Condition (LPS)	.27	-.01 - .56	0.06
Condition*Time 1	.50	-.03 - 1.03	0.06
Condition*Time 2	-.05	-.42 - .32	0.81
Session	.27	.09 - .46	0.004
Intercept	1.32	1.10 - 1.536164	<0.001

Self-rated current health	b	95% Confidence interval	p
Time 1 (3 h vs baseline)	.18	-.19 - .56	0.34
Time 2 (7 h vs baseline)	.14	-.18 - .45	0.40
Condition (LPS)	.5	.11 - .89	0.012
Condition*Time 1	2.82	2.18 - 3.45	<0.001
Condition*Time 2	.5	-.12 - 1.12	0.12
Session	.18	-.08 - .45	0.18
Intercept	1.64	1.36 - 1.91	<0.001

Results

1. Three hours after injection, current health was significantly poorer in the endotoxin group ($b=2.82$, $0<.001$) while a trend was seen for general health ($b=.50$, $p<.10$).
2. Change in TNF-alpha and sickness behavior was significantly associated with change in current self-rated health ($p<.01$) and change in all cytokines and change in sickness behavior was significantly associated with change in general self-rated health ($p's<.02$).

Conclusion

Change in cytokines and sickness behavior is associated with change in both current and general health perception. These findings using an experimental model of inflammation give further support to previous findings suggesting inflammation as a determinant of self-rated health, with sickness behavior as a possible mediating factor.

References

Andreasson A, Wicksell RK, Lodin K, Karshikoff B, Axelsson J, Lekander M. A Global Measure of Sickness Behavior: Development of the Sickness Questionnaire. *J Health Psychol.* 2016 Jul 24. pii: 1359105316659917.

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