

Loneliness linked to brain inflammation – but here's why drugs aren't the answer

November 24 2015, by Peter Kinderman



Maybe I should just go talk to them? Credit: Burim/wikimedia, CC BY-SA

Loneliness is not just an excruciating feeling that can lead to other mental health problems, it can actually be a [cause of premature death](#). While loneliness can affect anyone at any point in life, it is particularly

common among the rapidly increasing population of old people. When you read stories about how many old people [live alone](#) and say the television is their main company, you realise that tackling loneliness is one of the greatest challenges facing our society.

Now a [new study](#) in humans and [rhesus macaques](#) suggests that [loneliness](#) is associated with inflammation of the [brain](#). This is potentially a very important finding, but it is important not to jump to conclusions. Understanding the biological response to a condition like loneliness should lead to a more holistic understanding of [mental health problems](#) rather than a knee-jerk medicalised solution like a quick-fix drug.

Mind and matter

The new study looked at 141 humans who identified as feeling socially isolated and 30 macaques based on their social behaviour. It found that both macaques and humans that were lonely had elevated levels of various biological markers of inflammation, specifically increased activity of inflammatory genes and reduced activity of anti-viral genes. They also showed increased activity of the sympathetic nervous system, which stimulates the body's "fight-or-flight response", and an area of the brain that is associated with social threat (the hypothalamus-pituitary-adrenal-axis).

In simple terms, this means they had inflammation of the brain. It might sound dramatic, but it shouldn't be surprising. Ultimately, all psychological experiences, including our response to social isolation, will [be reflected](#) in the biological activity of our brains. And ultimately, things that affect us profoundly will have a deeper impact.

The finding comes just a month after a [major study](#) published in the *American Journal of Psychiatry* found that similar inflammatory activity

in the brain was associated with reports of psychotic experiences, such as hearing voices, paranoid anxieties, and unusual beliefs. It's understandable that the authors were hopeful that their research could lead to "the hope of life-changing treatments" of conditions such as schizophrenia.

Medical breakthroughs in psychiatry are [notoriously elusive](#). This may partly be because the diagnostic labels often used as the basis for investigation are [often criticised](#) for being unreliable, invalid and divisive.

More fundamentally, some of the assumptions of a traditional "disease-model" approach [are questionable](#) – in particular the assumption that the experience of mental health problems reflects some underlying pathology not shared by other people.

A new model for mental health?

It's premature to come to any conclusions. But we can see shadows through the fog of a possible, illustrative, shape. We know that people's experiences in life are of [profound importance in determining their mental health](#), even in the case of the most serious forms of distress such as psychosis. Among these social threats, loneliness seems to have important biological consequences (and it's worth pointing out that the present findings don't relate to genetic differences between people, they refer to how the genes present in all individuals are expressed differently when people are socially isolated).

The inflammatory response seen in the study has implications for physical health, but it also affects the way that the brain "prunes" synapses. This is the mechanism through which neural connections are broken and reformed, ultimately leading to new associations and learning. It is very tempting to see the effect as a biomarker for disease;

evidence that mental health problems are fundamentally illnesses of the brain. But for me, this is not evidence that people with mental illnesses have dysfunctional, inflamed brains. Instead, it's evidence that the events that we experience can [affect us in profound ways](#) – ways that of course influence the functioning of the brain and how we make sense of our world.

Findings such as these are complex. And the implications for our rich and sometimes contradictory lives will take a great deal of unravelling. But the idea of a genuinely bio-psychosocial model of mental health – something to which we often only give [lip service](#) – might be a little closer.

However, a shortsighted approach to these issues might lead us to conclude that anti-inflammatory drugs could be the solution for people with a range of mental [health problems](#). But do we really want to contemplate a drug to "treat" loneliness? It strikes me as important and potentially valuable to learn more about how we react to social adversity, and it is intriguing that this involves inflammation. But to me, it is much more important that we address those underlying social issues that affect our [mental health](#) than simply prescribing medication.

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