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## Month of birth in relation to suicide

Salib & Cortina-Borja<sup>1</sup> find that persons born during the spring–summer season of April, May and June were significantly more likely to die by suicide than those born during other months: they find a peak for May and a trough for October.

However, they misreport our earlier results in this field when they state in the introduction that ‘Chotai *et al*<sup>2</sup> reported that people born in winter in Sweden were significantly more likely than those with other birth seasons to have used hanging as a suicide method’. They further misreport earlier findings of ours when they state in the discussion that: ‘. . . winter variations in serotonin reported by Chotai & Åsberg<sup>3</sup> are inconsistent with the findings of this study, essentially the opposite of the Swedish findings<sup>3</sup>’.

Our earlier findings are in fact similar to and consistent with the results of Salib & Cortina-Borja. In Chotai *et al*<sup>2</sup> we clearly show that those who preferred hanging rather than poisoning or petrol gases were significantly more likely to be born during February–April. In Chotai & Åsberg<sup>3</sup> we demonstrate that those born during February–April had significantly lower levels of 5-hydroindoleacetic acid (5-HIAA).

We have also published cosine analyses of our data,<sup>4</sup> in which we found that the minimum of the month-of-birth curve for 5-HIAA was obtained for the birth month April (*t*-min 3.4, Table 1, where the interval 3–4 depicts April) and the maximum was obtained for October (*t*-max 9.4). We also reported that the maximum of the month-of-birth curve for preferring hanging was for March–April and the minimum was for September–October.

Low serotonin turnover has been implicated as a risk factor for suicidal behaviour, particularly with violent or lethal methods of suicide, as discussed by Salib & Cortina-Borja.<sup>1</sup> Thus, our findings are in line with those of Salib & Cortina-Borja regarding suicidality, since we obtained a peak for the birth month April comparable to their peak for May, and found a trough for 5-HIAA for the birth month April.

In another epidemiological study,<sup>5</sup> we report that season of birth association with suicide methods is found in those without a history of psychiatric contacts, but not in those with such a history. We have argued that season of birth associations for suicide methods are likely to be mediated to a large extent by a suicidality trait independently of specific major psychiatric disorders, with serotonin as the likely underlying neurotransmitter.

In our studies, the season of birth variation was found for hanging as the suicide method, but not for other methods often denoted as violent, for example firearms or drowning. Hanging is a more universal method of suicide, and gender differences in the proportion of hanging are much lower than for other methods. In this light, it would be of interest to analyse the data of Salib & Cortina-Borja, specifically with regard to whether there is a month of birth variation in suicide by hanging.

1 Salib E, Cortina-Borja M. Effect of month of birth on the risk of suicide. *Br J Psychiatry* 2006; **188**: 416–22.

2 Chotai J, Salander Renberg E, Jacobsson L. Season of birth associated with the age and method of suicide. *Arch Suicide Res* 1999; **5**: 245–54.

3 Chotai J, Åsberg M. Variations in CSF monoamine metabolites according to the season of birth. *Neuropsychobiology* 1999; **39**: 57–62.

4 Chotai J, Adolfsson R. Converging evidence suggests that monoamine neurotransmitter turnover in human adults is associated with their season of birth. *Eur Arch Psychiatry Clin Neurosci* 2002; **252**: 130–4.

5 Chotai J, Salander Renberg E. Season of birth variations in suicide methods in relation to any history of psychiatric contacts support an independent suicidality trait. *J Affect Disord* 2002; **69**: 69–81.

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Salib & Cortina-Borja<sup>1</sup> describe a disproportional excess of people who kill themselves when born in early winter and between late spring and midsummer, and a disproportional deficit when born in late autumn. This month of birth effect can be interpreted in the context of another unexplained characteristic, namely the increasing south–north gradient (i.e. the geographical latitude effect, as shown in different countries).

Optimal maturation of the oocyte in animals and humans has been proposed to occur during the prime time of the seasonally-bound ovulatory seasons and to lead to optimal development of the zygote leading to less morbidity during pregnancy, birth and adulthood. In contrast, non-optimal maturation would occur during the inherent transitional stages leading to errant early neural migration and/or developmental differentiation.<sup>2</sup> This seasonally-bound month of birth effect is recognised in the presented data, particularly in females (violent and non-violent methods) and males (non-violent methods), and in anencephalia, schizophrenia and related diseases such as eating disorders.<sup>3</sup> This concept also explains the shorter life expectancy for people born during the first part of the year *v.* the longer expectancy during the second part, and its mirror image on the southern hemisphere.<sup>4</sup>

Seasonality of the ovulatory pattern as cause of month of birth effect on suicide can easily be connected with the geographical latitude effect. In fact, the consistent relation between timing of mating seasons in different animals and humans causes stronger transitional stages the further distanced from the equator and, thus, higher frequency of non-optimal maturation of the oocytes. This biological phenomenon explains the mentioned geographical latitude effect on suicidality, schizophrenia and congenital anomalies of the nervous system, diverging between both hemispheres. The highly biased tertiary gender ratio in both suicidality and schizophrenia, and other high-risk factors such as teenage motherhood, multiparity and intrauterine growth retardation,<sup>5</sup> are quite compatible with this concept. This month of birth factor, therefore, does not need to be interpreted in terms of the ‘foetal origins’ hypothesis, nor the ‘maternal–foetal origins’ hypothesis, as suggested by the authors, but rather of the ‘oocyte origins’ hypothesis.

1 Salib E, Cortina-Borja M. Effect of month of birth on the risk of suicide. *Br J Psychiatry* 2006; **188**: 416–22.

2 Jongbloet PH. The effects of preovulatory overripeness of human eggs on development. In *Aging Gametes. Their Biology and Pathology* (ed RJ Blandau): 300–29. Karger, 1975.

3 Jongbloet PH, Groenewoud HMM, Roeleveld N. Seasonally-bound ovopathy versus ‘temperature at conception’ as cause for anorexia nervosa. *Int J Eat Disord* 2005; **38**: 236–43.

4 Doblhammer G, Vaupel JW. Lifespan depends on month of birth. *Proc Natl Acad Sci USA* 2001; **98**: 2934–9.

5 Mittendorfer-Rutz E, Rasmussen F, Wasserman D. Restricted fetal growth and adverse maternal psychosocial and socioeconomic conditions as risk factors for suicidal behaviour of offspring: a cohort study. *Lancet* 2004; **364**: 1335–40.

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**Authors' reply:** Jongbloet provides an alternative explanation of our findings about the effect of month of birth on suicide that is based on the oocyte origins hypothesis as opposed to the maternal–foetal origin hypothesis. The oocyte hypothesis (also referred to in literature as ‘conception hypothesis’) may have significant implications in psychiatry. The intricate interplay between non-optimal oocyte maturation and genes results in a complex pathogenesis of the resultant foetuses or individuals. This occurs in well-timed menstrual cycles, but more so in instances of distorted hormonal tuning, not only in deprived socio-economic conditions but also at the extremes of maternal reproductive life, among endocrinologically unbalanced mothers, after very short pregnancy intervals during the seasonal transitions of the ‘ovulatory’ seasons, etc.<sup>1</sup> A similar broad spectrum of male-biased developmental anomalies – low birth weight and length, small stature at school age or adulthood, morbidity, and mortality – is present in all these circumstances.<sup>2</sup>

To illustrate the oocyte or conception hypothesis in practical terms: mothers with low socio-economic status are known to suffer from more menstrual disorders,<sup>3</sup> low standards of nutrition and abnormal body mass index. They also are more likely to be smokers or to misuse drugs<sup>4</sup> and to employ less safe methods of contraception resulting in unplanned and unwanted pregnancies, particularly at the extremes of maternal reproductive age and during the postpartum restoration of the ovulatory pattern (i.e. after very short inter-pregnancy intervals). They are likely to have non-optimal oocyte maturation, thus rendering the offspring vulnerable to low birth weight and certain psychiatric disorders. However, we are not clear as to how this hypothesis actually differs from the maternal–foetal origin hypothesis used to explain our findings.<sup>5</sup>

The geographical latitude effect in incidence rates of suicide in England, Wales and elsewhere is assumed by Jongbloet to be a consequence of the stronger seasonal ovulatory pattern the further away from the equator, just as in animals, and, in turn, stronger transitional stages between the ovulatory seasons and, thus, more poor-quality oocytes. However, the only way to accept or reject this concept is by demonstrating the same increase of suicide incidence rate – and of other disease entities or behaviour of complex origin.

We are also grateful to Chotai for his comments. Although we did not look at hanging in relation to month of birth in our study, we did in fact examine the relationship between month of birth and violent suicide (including hanging) as opposed to non-violent suicide, but found no significant association. However, a previous study,<sup>6</sup> in an attempt to replicate the findings of Chotai *et al.*,<sup>7</sup> showed that those born during the season January–April were more likely to prefer hanging than poisoning: data from North Cheshire ( $n=502$ ) appeared to suggest that suicide by hanging was significantly more frequent in those born in the summer months compared with those who used other methods such as poisoning by solids or gases. The findings were not in keeping with reports by Chotai *et al.* However, methodological limitations of the North Cheshire study, including a relatively small sample size, have significantly limited its inferential value. Studies with sufficient power to detect the association between month of birth and risk of hanging are required to show whether one truly exists. Seasonality of birth studies in relation to suicide may enhance our understanding of some biological aspects in the aetiology of

suicide such as the oocyte origins hypothesis proposed by Jongbloet.

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### Reattribution for medically unexplained symptoms

Morriss *et al*<sup>1</sup> performed a high-quality cluster randomised controlled trial in which reattribution for medically unexplained symptoms was taught to general practitioners (GPs). We compliment the authors on this trial. Strong points of their trial are the avoidance of selection bias by using an independent GP for inclusion, and the inclusion of patients for whom unexplained symptoms of sufficient duration were the reason for the encounter. However, we have some critical comments as well.

First, the training of GPs took only 6 hours and was performed by non-expert trainers. Reattribution is not an easy technique to learn. Other researchers have used training programmes of at least 20 hours.<sup>2,3</sup> The trainers in this study were three nurses and a psychologist. Although they were prepared intensively, they might not have been familiar enough with GP consultations. Consequently, we have doubts about the thoroughness and effectiveness of the training for GPs.

Second, the effect of reattribution training on doctor–patient communication has been evaluated in only one consultation. Reattribution usually takes more than one consultation.<sup>4</sup> Making an inventory of the problems and broadening the agenda can lead to quite a disturbance of the normal flow of the consultation. Patients often need more time to make a link between their psychosocial and physical problems. In the article it seems like it was mostly the doctor who made the link. This does not fit into the original reattribution model. A negotiating style is needed in order to let the patient raise the possibility of a link him- or herself.<sup>4</sup> For the purpose of effective reattribution, the patient has to come up with the link and not the doctor.<sup>2,3</sup>

Third, we know that the effectiveness of psychological treatments consists of specific and non-specific effects. Non-specific effects are effects caused by mutual trust, empathy and shared understanding.<sup>5</sup> The training in reattribution and applying it might have influenced the physicians' relation with the patient negatively because of the physicians being absorbed by the application of the new intervention. Less attention for empathy and other non-specific effects might have been an additional cause for the absence of treatment effects.

Finally, it is a pity that the authors did not differentiate the outcome effects for subgroups. Patients with medically unexplained symptoms form a heterogeneous group. ‘Treatment effects