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Editor-in-Chief

**Some seasonal environmental factors might increase the risk for disorders of the brain, body, and mind**

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## Seasonality of birth and psychiatric illness

**“To every thing there is a season, and a time to every purpose under the heaven.”**

— Ecclesiastes

The month of birth is not just relevant to one’s astrological sign. It may have medical consequences. An impressive number of published studies have found that the month and season of birth may be related to a higher risk of various medical and psychiatric disorders.

For decades, it has been reported in more than 250 studies<sup>1</sup> that a disproportionate number of individuals with schizophrenia are born during the winter months (January/February/March in the Northern Hemisphere and July/August/September in the Southern Hemisphere). This seasonal pattern was eventually linked to the lack of sunlight during winter months and a deficiency of vitamin D, a hormone that is critical for normal brain development. Recent studies have reported that very low serum levels of vitamin D during pregnancy significantly increase the risk of schizophrenia in offspring.<sup>2</sup>

But the plot thickens. Numerous studies over the past 20 to 30 years have reported an association between month or season of birth with sundry general medical and psychiatric conditions. Even longevity has been reported to vary with season of birth,

with a longer life span for people born in autumn (October to December), compared with those born in spring (April to June).<sup>3</sup> Of note, a longer life span for an individual born in autumn has been attributed to a higher birth weight during that season compared with those born in other seasons. In addition, the shorter life span of those with spring births has been attributed to factors during fetal life that increase the susceptibility to disease later in life (after age 50).

The following studies have reported an association between month/season of birth and general medical disorders:

- Higher rate of myopia for summer births<sup>4</sup>
- Tenfold higher risk of respiratory syncytial virus in babies born in January compared with October, and a 2 to 3 times higher risk of hospitalization<sup>5</sup>
- Higher rates of asthma during childhood for March and April births<sup>6</sup>
- Lower rate of lung cancer for winter births compared with all other seasons<sup>7</sup>
- An excess of colon and rectal cancer for people born in September, and the lowest rate for spring births<sup>8</sup>
- Lowest diabetes risk for summer births<sup>9</sup>
- For males: Cardiac mortality is 11% less likely for 4th-quarter births compared with 1st-quarter births. For females: Cancer mortality is lowest in 3rd-quarter vs 1st-quarter births<sup>10</sup>

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- The peak risk for both Hodgkin and non-Hodgkin lymphoma is for April births compared with other months<sup>11</sup>

- A strong trend for malignant neoplasm in males was reported for births during the 1st trimester of the year (January through April) compared with the rest of the year<sup>12</sup>

- Higher rate of spring births among patients who have insulin-dependent diabetes<sup>13</sup>

- Breast cancer is 5% higher for June births compared with December births<sup>14</sup>

- Higher risk of developing an allergy later in life for those born approximately 3 months before the main allergy season.<sup>15</sup>

The above studies may imply that birth seasonality is medical destiny. However, most such reports need further replication, or may be due to chance findings in various databases. However, they are worth considering as hypothesis-generating signals.

And now for the risk of psychiatric disorders and month or season of birth. Here, too, there are multiple published reports:

- Higher social anhedonia and schizoid features among persons born in June and July<sup>16</sup>

- Higher autism rates for children conceived in December to March compared with those conceived during summer months<sup>17</sup>

- In contrast to the above report, the risk of autism spectrum disorders in the United Kingdom was higher for those born in summer<sup>18</sup>

- Another study labeled seasonality of birth in autism as “fiction”!<sup>19</sup>

- Significant spring births for persons with anxiety<sup>20</sup>

- Highest occurrence of postpartum depression in December<sup>21</sup>

- High prepartum depression in winter and postpartum depression in fall<sup>22</sup>

- Lower performance IQ among spring births<sup>23</sup>

- Disproportionate excess of births in April, May, and June for those who die by suicide<sup>24</sup>

- Suicide by burning oneself is higher among individuals born in January compared with any other month<sup>25</sup>

- Relative increase in March and August births among patients with anorexia<sup>26</sup>

- Season of birth is a predictor of emotional and behavioral regulation<sup>27</sup>

- Serotonin metabolites show a peak in spring and a trough in fall<sup>28</sup>

- Increase of spring births in individuals with Down syndrome<sup>29</sup>

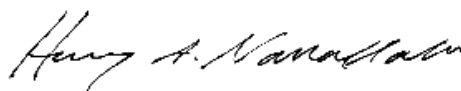
- Excess of spring births among patients with Alzheimer’s disease.<sup>30</sup>

As with the seasonality of medical illness risk, the association of the month or season of birth with psychiatric disorders may be based on skewed samples or simply a chance finding. However, there may be some seasonal environmental factors that could increase the risk for disorders of the body or the brain/mind. The most plausible factors may be season-related fetal developmental disruptions caused by maternal infection, diet, lack of sunlight, temperature, substance use, or immune dysregulation from comorbid medical conditions during pregnancy. Some researchers have speculated that fluctuations in the availability of various fresh fruits and vegetables during certain seasons of the year may influence fetal development or increase the susceptibility to some medical disorders. This may be at the time of conception or during the 2nd trimester of pregnancy, when the brain develops.

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On the other hand, those studies, published in peer-reviewed journals, may constitute a sophisticated form of “psychiatric astrology” whose credibility could be as suspect as the imaginative predictions of one’s horoscope in the daily newspaper...



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The most plausible factors may be season-related fetal developmental disruptions

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