

Commentary

## Psychological factors associated with self-reported sensitivity to mobile phones

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Do persons with electrosensitivity differ from individuals reporting symptoms from exposure to mobile phones only? This is the main question addressed in the paper by Rubin et al. [1] in this issue. Previous provocation studies for electromagnetic sensitivity have found no differences in the severity of symptoms elicited by active or sham exposure to electromagnetic fields [2]. Still, a strong perceived association between electromagnetic radiation and a range of nonspecific health complaints exists in the general public. The topic is highly relevant on both an individual and a societal level. Electrosensitivity, alongside with other quite similar functional disorders with nonspecific complaints, accounts for significant public burden, including increased work absenteeism and increased health utilization [3], in addition to the individual consequences from such disorders. Thus, identifying subgroups with a high risk of these adverse consequences is of importance.

The study by Rubin et al. is rather small scale, comprising 19 self-labeled electrosensitive individuals compared with 52 persons reporting sensitivity to only mobile phones, as well as 60 healthy controls. Nevertheless, the authors found significant group differences on quite a few outcome measures. A few methodological issues warrant further discussion. As noted by the authors, the most important limitation of the study is its cross-sectional design, which obviously makes it difficult to infer a direction of causality. For example, do negative affect and personal concerns regarding cell phone radiation cause electrosensitivity or

vice versa? Exposure studies and prospective studies are needed to resolve this issue. The authors argue quite convincingly for the former hypotheses, citing a prospective exposure study by Petrie et al. [4] that shows that a higher level of worries before environmental pesticide spraying was a strong predictor of reported symptoms following the exposure, supporting the notion that health complaints are secondary. Also, a prospective study is currently underway in Norway, linking two large-scale studies conducted 10 years apart, in which data on self-reported diagnosis in the latter study (including a range of functional syndromes) can be predicted by a range of psychosocial predictors (and possible confounders) in the former study. Still, more exposure studies and prospective epidemiological studies are needed.

As hypothesized by the authors, the electrosensitive group was more worried about modernity in general, and they also reported worse somatic and psychological health, in addition to having more medically unexplained syndromes than any of the other two groups. In addition, the electrosensitive group was older and reported to use their mobile phone more often for work purposes.

How can the increased physical and mental morbidity in this group be explained? To date, there has been little support for electromagnetic radiation itself having such consequences. The authors are open to the possibility that the “sensitizers” may be experiencing symptoms from other illnesses, but it is more likely that the symptoms they experience are the everyday complaints that most people have. Having some sort of subjective health complaint is more common than being completely symptom free, and a recent Scandinavian study found that 96% of the general population reported having at least one health complaint or

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more during the last month [5]. People will then usually try to make sense of these experiences, a process that is mediated by both cognitive and affective factors. Mobile phones and other electrical devices may share some characteristics that increase perceived risk and, thus, are seen as a likely cause of the health complaints. It is well known that when the risk is involuntary, poorly understood by science, and unfamiliar or novel, the perceived risk increases [6]. In the study by Rubin et al., the sensitizers reported using mobile phones significantly more at work than the other groups, suggesting more involuntary use. Moreover, the sensitizers were significantly older than the other groups, and this age difference might have affected these individuals' causal inferences of their health complaints, as modern technology is more likely to be unfamiliar in the elderly. Another well-known risk perception principle is the availability heuristic, which refers to the tendency to consider events to be more likely or frequent when instances of a given risk come more easily to mind [7]. In the society as a whole, the media's increased coverage of new and previously unknown health effects of new technology, including various electrical devices, has increased perception of people's vulnerability to this new technology and increased the attention to its possible health effect. In addition to cognitive factors, worry and psychological distress are known to be related to symptom reporting, and the interplay between these factors can soon become a vicious circle leading to significant functional impairment [8].

In the present study, the sensitizers reported a higher rate of modern health worries in general, as well as other functional disorders. This is in accordance with previous findings where people who were concerned about the adverse health effects of modern life had more functional illnesses and used alternative health care more often than nonworried individuals [9]. The specificity of electrosensitivity as a separate condition may thus be questioned, as a high degree of overlap between the different conditions is typically found. In conditions with health complaints attributed to various aspects of modern life, the specific causal attribution (e.g.,

electricity and mobile phones) may not be the main factor. The degree and severity of worry, health complaints, and related functional impairment may be the most important indicators when assessing need of intervention. With regard to treatment options for patients suffering from electrosensitivity, available evidence remains limited, although a few studies have shown cognitive–behavioral therapy to be quite effective for patients who report being hypersensitive to weak electromagnetic radiation [10]. However, as Rubin concludes, more research is needed before any definitive clinical recommendations can be made.

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