



Clinical Group

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Case Report

Antipsychotics, Hypothermia, Undressing, and Death

Abstract

One of the lesser-known adverse effects of antipsychotic medication is hypothermia, a significant and protracted plunge in body temperature. Known risk factors are older age and exposure to a new-for-the-person antipsychotic drug. Hypothermia impairs cognitive function, often resulting in a delirium that can paradoxically induce the prescription of escalating doses of the offending drug. As hypothermia increases, the subjective experience of the person may be one of overwhelming heat that can lead to the person shedding protective clothing, an action that can precipitate death.

Case Example

A 62-year-old male patient had, for many years, been suffering from schizophrenia and had more recently developed Type 2 diabetes mellitus. He lived an isolated life in government-subsidized housing, was overweight, spoke very little and exhibited many of the negative symptoms of schizophrenia (lack of interests, lack of energy, lack of social skills). Throughout his psychiatric illness, which had begun in adolescence, he had been treated with first generation antipsychotics and, when second generation drugs became available, his doctor admitted him to hospital to be switched to olanzapine. On the ward, he caused a nightly disturbance by going through the public corridor to the bathroom in the buff. This behavior disturbed the staff [1], which led to many clinical discussions as to how it could be best corrected. The staff consensus was that the patient was seeking attention; consequently, an elaborate behavioral program was devised to stop the patient's naked dashes to the bathroom at night. A variety of contingent rewards proved of no avail. Punishments were also tried - isolation, visitor restriction, denial of weekend privileges. The patient appeared not to understand what the problem was, nor what was required of him. Since the behavioral program was not working and the switch from the old medication to olanzapine had, in the meantime, been completed, the patient was discharged to his public housing unit where he lived alone. Temperatures outside that winter were substantially below zero.

Three days later, he was found frozen to death on the sidewalk outside his residence. He was completely naked; his clothes were stacked in a neat pile beside him. Although there was no suicide note, the coroner attributed the death to

suicide. Given the patient's psychiatric history, the conclusion was that he had deliberately walked out into the cold and taken off his clothes in order to freeze himself to death. Suicide while in the nude is, apparently, a known entity [2], (though purposefully freezing oneself to death has never been reported in this context). The patient's extended family and long-term clinicians stated that there was no previous history of suicidal threats or gestures; nevertheless, the care providers who had looked after him during his recent hospital stay and thought of him as "attention-seeking" considered it possible that he had deliberately staged a melodramatic ending [3] to an otherwise uneventful life.

Discussion

The death of this patient occurred twenty years ago, but it has remained a puzzle. Having known the patient for many years, I cannot believe that he committed suicide. I have wondered whether he may have been a sleepwalker. Like hypothermia, sleepwalking is a rarely recognized side effect of antipsychotic medication [4]. The naked streaking in the hospital at night may have been a form of sleepwalking, which would account for his afterwards not understanding what he had done wrong. The final walk out into the street and the shedding of clothes may have been the action of a sleepwalker.

The other explanatory hypothesis is hypothermia, defined as body temperature falling below 35°C. While malignant hyperthermia is a well-known and potentially fatal adverse effect of antipsychotics, its opposite, hypothermia, is less well-recognized. In 2007, van Marum [5], using the World Health Organization database, reviewed 480 cases of hypothermia associated with the use of antipsychotic medication. A large number of these, 44, were linked to olanzapine.

Body temperature is downregulated by dopamine and upregulated by serotonin so that drugs potent at both these receptors (like olanzapine) are the ones most likely to cause hypothermia, especially, it has been reported, at drug initiation or whenever the dose is rapidly increased [5,6]. Hypothermia has been known to occur after even one dose of a new potentially offending drug when taken by a susceptible subject.

Hypothermia secondary to antipsychotics may be a special problem for hospitalized patients, as adequate hospital room temperature is often difficult to maintain. It is difficult to accommodate the heterogeneity of temperature needs of the many hospital users whose age, medical conditions, treatment regimes, and activity levels vary widely. On most psychiatric wards, there is no individualization of temperature control, and many patients complain of being either too hot or too cold when in hospital [7]. Unless patients complain, hypothermia may not be recognized in hospital; it is difficult to observe unless temperatures monitoring becomes a regular routine [8].

One could speculate that it was hypothermia that led the patient to peel off his clothes at night in the hospital. This may seem counterintuitive, but there is a known association between hypothermia and paradoxical undressing [9]. It appears to be a consequence of thermoregulatory functions gone askew, leading to inappropriate vasomotor reactions (vasodilation subsequent to peripheral vasoconstriction) that produce a subjective sensation of unbearable heat that, in turn, leads to undressing. Paradoxical undressing in association with hypothermia is not uncommon. It is known to occur in approximately 30% of proven hypothermia cases [10].

Why might this patient have been susceptible to hypothermia? He did not suffer from the medical conditions most closely associated in the literature with hypothermia e.g. acute spinal cord injury, adrenal insufficiency, anorexia nervosa, cardiac arrest, hypothyroidism, renal disease, shock from severe burns or trauma, sepsis or stroke [6,11]. Nevertheless, both schizophrenia and diabetes are reported risk factors, with or without the drugs used as treatment [6,7]. Oral glyemics (the patient was taking Metformin) are an added risk factor. Sedatives increase the risk, as do ethanol and second-generation antipsychotic drugs [6,11,12]. The patient did not take sleeping medication nor did he drink alcohol, but had been newly switched to olanzapine, a potent serotonin as well as dopamine blocker [10,13]. He was 62. Hypothermia is associated with increasing age; in the context of antipsychotic treatment, it has been reported in adults as young as 40. In a recent case report of hypothermia in a patient treated with antipsychotics, the age was 58 [13].

How might hypothermia have led to this patient's death? He was discharged from hospital to his poorly-insulated room when outside temperatures were subzero. Low temperatures in the elderly can trigger lethal cardiovascular problems [14,15]. Because of hypothermia, the patient may have felt a paradoxical sensation of heat and decided to go outside to try to cool off.

Once outside, the heat sensation would have increased, which would account for his taking off his clothes, especially since, by then, he may well have been cognitively impaired as a result of the intense cold [12].

Conclusion

Lessons to be learned from this case are A) Medical and nursing staff need to be familiar with all the side effects of the drugs they administer, no matter how rare some of the effects are. B) Before attributing psychiatric patient behavior to attention seeking, all other potential causes of the behavior need to be considered. I am old enough to remember an earlier decade when the blinking and spasmodic movements of tardive dyskinesia were attributed by some to attention seeking [16]. C) The temperature in hospital rooms needs to be carefully monitored, especially when patients are unable to verbally express their discomfort. On psychiatric wards, this is especially important for older patients and in those whose medication regimen is being changed or whose dose of drugs is being rapidly increased.

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