

Extending trust

A report of a potential therapy for some of the social behavior patterns associated with autism highlights the need for a societal dialog to discuss the ethical issues raised by these treatments.

A paper suggesting that oxytocin can improve social skills of people suffering from autism spectrum disorders (ASD) has raised hopes that a 'cure' for some aspects of autism may be imminent. In this study (*Proc. Natl. Acad. Sci. USA* **107**, 4389–4394, 2010), E. Andari and colleagues gave oxytocin, a hormone previously linked to autism and known to be involved in regulating many social emotions (such as trust and the bond between mother and child), nasally to people diagnosed with high-functioning ASD. After oxytocin inhalation, subjects reported enhanced feelings of trust, gazed more often at the eyes of human faces when viewing a picture and showed more normal social behavior in an online ball game. If the results from this preliminary study are replicated by large-scale trials, it would be very welcome news for the many people diagnosed with ASD and their families. However, oxytocin could also potentially improve the social performance of typically developed subjects who are not clinically diagnosed with ASD. Given these potential applications, it is critical that scientists engage in a serious dialog about the ethical questions raised by these treatments, and help form guidelines about regulation of such treatments and 'off-label' use.

The focus on behavior in ASD diagnoses and in measuring treatment outcome is necessitated by the lack of any clear biomarkers, a problem that autism shares with many other mental disorders. However, the current clinical definition of ASD inherently acknowledges that its behavioral symptoms exist on a spectrum and, thus, that the dividing line between a child with ASD and a typically developing one can be quite blurry. For example, one study using the behavioral ASD questionnaire (B. Auyeung *et al.*, *J. Autism Dev. Disord.* **38**, 1230–1240, 2008) reported that up to 7% of the normal subject population had scores comparable to those of subjects with a formal ASD diagnosis. This line can be murkier still when considering one behavioral trait in isolation: a very shy child may have as difficult a time forming social relationships as a child diagnosed with ASD. These symptoms may also be transient; many people may eventually be able to improve their social skills to function effectively in society without the help of medication.

Even when the lack of appropriate social skills is not serious enough to warrant a formal diagnosis, there may still be the temptation to intervene pharmacologically. Recent surveys suggest that many people are willing to intervene not just to ameliorate deficits, but to enhance normal functioning: as many as 25% of the students on some university campuses have used prescription drugs to improve concentration and memory. A *Nature* survey (B. Maher, *Nature* **452**, 674–675, 2008) found that, across all age groups, a substantial minority of people had

used drugs such as methylphenidate (Ritalin), usually used to manage the symptoms of ADHD, to improve their focus on specific tasks, or modafinil, normally used to treat sleep disorders, to combat fatigue.

Given this, it is quite likely that oxytocin may be similarly used to enhance normal behavior, such as overcoming anxiety before a job interview or helping a shy child make friends at school. Indeed, companies claiming to sell oxytocin as a means to promote smoother business dealings are already ubiquitous on the internet, on the basis of a separate line of work showing that oxytocin can increase trust in social interactions. Even though such 'off-label' uses may be discouraged by the scientific community, the easy availability of these substances, coupled with a proven willingness among many to try these drugs, means that such usage could be common.

Whereas some may argue that such enhancement may be beneficial, and encourage the responsible use of these drugs by everyone, others worry that this will lead to increasing medicalization of normal behavior. This concern is also shared by many high-functioning people with ASD and their families: a growing neurodiversity movement encourages the view that autism comes with advantages as well as disadvantages and that acceptance of these differences by society is more important than a cure. Although this view is far from universally accepted, many people with ASD feel that their condition provides them with a unique viewpoint on the world and that attempts to alter their behavior are more for the benefit of those around them.

It is unlikely that there will be a universally satisfactory resolution to these opposing points of view. However, it is essential that all interested parties—scientists, physicians, educators and policy makers—engage in a serious dialog about the possible uses and abuses of these types of treatment, and formulate ways to responsibly regulate them. A critical first step in this direction is to ensure that the public is fully informed about the pros and cons of these treatments. For instance, it is as yet unclear what the long-term consequences of medicating children (or adults) with oxytocin will be, and there are yet to be large-scale clinical trials in pediatric populations testing the safety and efficacy of oxytocin and similar treatments. It is not yet clear whether such pharmacological treatments are superior to behavioral therapies in treating some of ASD's symptoms, and it is also unclear whether this spray will work well or have the same long-term effects for all forms of ASD—given that they may have very different genetic causes. However, the availability of treatments potentially 'normalizing' the vast variety of social behaviors necessitates a vigorous discussion. It is imperative that scientists lead this debate. ■