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The Ethical Defensibility of Memory Dampening Pharmaceuticals Hinges on Context and Regulation

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Biography

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Abstract

An estimated 8% of Americans suffer from post-traumatic stress disorder (PTSD). With most treatment options falling under the umbrella of cognitive behavioral therapy (CBT), effective pharmaceuticals are lacking. While the physiological underpinning for PTSD symptomology is ambiguous, the disorder's universal root cause is not. If pharmaceuticals could sever emotional connectedness to traumatic memories, PTSD may be avoided. An emerging field of research, memory dampening refers to the use of pharmaceuticals to diminish the deleterious emotional component of unpleasant or traumatic memories. While unregulated memory dampening poses pressing ethical issues, so does the discontinuation of research with promising potential in allowing the suffering to reclaim their lives. Memory dampening research is ethically justified when focused on this therapeutic intention with appropriate regulation.

Keywords

Memory Dampening, Post-Traumatic Stress Disorder, Neuromodulation, Autonomy

Abbreviations

CBT: cognitive behavioral therapy, EM: emergency medicine, PTSD: post-traumatic stress disorder, SSRI: selective serotonin inhibitor, USA: United States

Introduction

Once doubted as legitimate by much of the general public and even many mental health professionals, post-traumatic stress disorder (PTSD) is now recognized for its physiological basis and shocking prevalence, affecting millions of Americans yearly. Fortunately, the suffering are now acknowledged and research efforts into prospective treatments have snowballed. Emanating from said research, cognitive behavioral therapy (CBT), a common type of talk therapy (psychotherapy), has demonstrated efficacy as a safe intervention for both acute and chronic PTSD. Focused on altering the thought patterns disturbing one's life, CBT may actually influence the underlying biology of PTSD (Levy-Gigi et al. 2013). While life-changing for many individuals, nonresponse to various

subsects of CBT, such as prolonged exposure therapy and stress inoculation training, can be as high as 50% (Kar 2011). To supplement psychotherapy, brain chemistry-modifying medications are routinely prescribed, primarily aiming to mitigate the easily triggered fight-or-flight responses characteristic of PTSD. Despite the two selective serotonin inhibitors (SSRIs) paroxetine and sertraline being the only FDA-approved drugs for PTSD treatment (Alexander 2012), 'off label' prescriptions are typical in PTSD recovery processes considering person-dependent symptoms and bodily responses to medications. While the current pharmaceuticals are generally successful in decreasing hyperarousal and negative mood manifestations, symptoms of re-experiencing, emotional numbing, and behavioral avoidance often remain (Ipser and Stein 2012).

In an unrelentless pursuit to aid the millions stuck under the grave cloud of PTSD, researchers are beginning to develop memory dampening pharmaceuticals. Intended to erode the negative emotional impact of emotionally-laden memories, memory dampening has already found a foothold by happenchance. An FDA-approved beta blocker designed to treat tremors, hypertension, and other heart or circulatory conditions, propranolol appears to disrupt memory reconsolidation, thereby dampening fear responses (Brunet et al. 2014; Lonergan et al. 2013; Schwabe et al. 2012). Seemingly an effective drug to block noradrenergic receptors in the amygdala during the reconsolidation process of traumatic memories (a postreactivation blockade of noradrenergic receptors is known to impair reconsolidation of fear memories (Dębiec, Bush, and LeDoux 2011)), propranolol can diminish the lingering effects of trauma and consequentially presents as a potentially efficacious PTSD treatment (Schwabe, Nader, and Pruessner 2013). Nonetheless, research is far from sufficient for FDA approval of propranolol's newfound use. Numerous studies contend memories do not necessarily undergo reconsolidation upon reactivation, unless new information is encoded (Sevenster, Beckers, and Kindt 2012; Parsons and Ressler 2013). Therefore, propranolol's targeting of reconsolidation may lack benefit for the older memories plaguing those with PTSD. A second issue warranting further investigation, strongly encoded fear memories undergo frequent reactivation, possibly resulting in overconsolidation (Pitman and Delahanty 2005). Could such overconsolidation limit propranolol's functionality?

To touch on the most topical memory dampening research, an activity-blocking mutant of the naturally-occurring protein kinase M zeta, or PKMzeta, has been discovered to suppress memory (LeBlancq, McKinney, and Dickson 2016). While trials to date have been exclusively performed in rats, researchers are optimistic for future translation to humans. Due to the debilitating nature of PTSD, research focused on alleviating symptoms, or better yet preventing the disorder's initial development, ought

to continue to ultimately determine pharmaceuticals' capacity to bring about long-lasting symptomatic relief. Foreseeable ethical dilemmas must inform the direction and application of research rather than prevent its continuance.

Discussion

In looking at the ethical implications of memory dampening research and the potential widespread accessibility to these pharmaceuticals, arguments on both sides of the aisle arise. Starting with the negative outlook, perhaps the greatest concern is compromising personal identity. After all, memories constitute our sense of personhood and dictate life perspective. Memory dampening may create an altered humanity with the chance for abuse and reckless use if left unregulated. If we are discouraged from authentically coping with trauma, is the traditional sense of 'growing from experience' lost? In turn, are we demeaning the genuineness of human experience while denying individuals the lives they would have lived without access to memory dampening (Kolber 2011)?

The next argument in opposition to the drugs, some have posited that there is a responsibility to remember, i.e. it is not ours to decide what memories we have/keep. While ethicists contend a distinctive duty to remember mass violence/injustice can reasonably fall upon societies (Walker 2017), the moral imperative is being forced upon individuals in this shoddy case against memory dampening. Such rationale is perplexing for a few reasons. If we ought not interfere with personal memories, then should psychotherapy and hypnotism also be disallowed? If so, what treatment is left for those suffering from PTSD? Must this so-called 'responsibility' to remember carry more weight in our deliberation than life-saving therapeutic interventions facilitating memory alteration?

Third, memory dampening challengers describe the potential for abuse, including the use for illicit purposes. For instance, memory dampening drugs could be dispensed to witnesses of crimes. However, the premise of this argument is flawed. While memory dampening may work in reducing the impact of traumatic memories by preventing overconsolidation, it does not erase memories. While forced administration of these drugs to people having witnessed nefarious activities is a scary concept, memory dampening does not fit into the predicament as the counterargument would wish.

Contrary to the above arguments, well-founded concerns must indeed direct research/dispensary guidelines. Blanket access to memory dampening pharmaceuticals

may aid criminals in their mischievous enterprises by inuring them to the pain of their victims. If numbed to others' agony, the moral compass is profoundly undermined, facilitating greater peace of mind amidst committing crime. On the other end of the spectrum, victims of horrendous acts may feel less obliged to fight back against injustice when emotional connection to memories is lost. That being said, the inherent propensity to help others must run parallel in our discussion. If memory dampening pharmaceuticals were regulated, those with the power to prescribe hold an obligation to recognize its complete ramifications, including the possibility that an individual seeking medication may be less willing to act against the experienced trauma/perpetrator later on. At the core of regulation is the need for documentation. Therefore, the documented need for memory dampening may stand in for the lack of emotional association with a particular memory subsequently. If a crime victim persistently shrugs off the opportunity to hold the aggressor(s) accountable, a medical professional may potentially report the offense on behalf of the victim. Regardless, we must ask ourselves the following question: is it ethically justified to prevent memory dampening for the purpose of ensuring all injustice is dealt with? The answer is a simple no; we must value the victim's long-term health above a potential conviction.

An obvious counterargument to this position would reference a patient's autonomy to decide whether or not to move forward with legal action. If the situation were to arise that a victim of a traumatic crime availed himself/herself of memory dampening drugs but refused to press charges at a later date, should another individual be allowed to circumvent this decision and take matters into his/her own hands? This is certainly a tricky ethical quandary to traverse, as is the potential for courts to delegitimize victim testimony. If a victim proceeded to press charges against a perpetrator following memory dampening, courts may consider his/her testimony null and void. From the legislative standpoint, how can a jury be persuaded by a victim's recall when memory has been purposely dampened? Again, this rationale represents valid apprehensiveness to the developing practice of memory dampening. Be that as it may, nuanced contexts must be evaluated in light of the advantages bestowed.

Before delving into the many benefits of memory dampening, a couple of other rightfully-concerning ethical considerations warrant discussion. Upon memory dampening availability, there is understandable uneasiness with the possibility of forced drug consumption. The tragedy that comes with PTSD is now widely circulated and family members or medical professionals may press someone having experienced an adverse event to utilize memory dampening. However, what if the individual wants to come to grips with the tragedy on his/her own? Perhaps he/she greatly values the

complete emotional ramifications of all memories regardless of prospective disorder development. Bearing in mind this foreseeable predicament, memory dampening must never be obligatory, nor should it be overly advocated. In fact, this defeats the treatment's purpose to honor autonomy and empower individuals to live their lives as they deem fit. Another ethically-contentious incentive to push memory dampening is the tremendous economic burden accompanying PTSD. In 2012, the government spent $3 billion on PTSD treatment for veterans (Zarembo 2014). For a typical patient, the average cost for the first year's treatment alone is $8,300 (Cushman 2012). What if physicians broadcasted this sometimes-crippling economic burden and inadvertently compromised autonomous choice? Once more, such subtleties must be considered and strict regulation/safeguards are mandatory before memory dampening may be ethically justified.

While the muddling ethics of physicians' prescribing practices have been alluded to, what about physician usage of memory dampening? Underrecognized, PTSD is more prevalent in physicians than the general population in the USA (Lazarus 2014). Particularly common amongst emergency medicine (EM) personnel, PTSD is a primary driver of their shortened average career length (4-7 years). To motivate EM physicians to stay in the field despite mentally-onerous trauma, salaries have increased 31% and clinical hours worked have dropped 12% in the past decade (Katz 2017). While more money and time away from work is helpful, the greatest incentive would be PTSD prevention, potentially accomplishable via propranolol administration prior to or immediately following traumatic situations. Sounding great in theory, it is important to delve into implications for patient care. If taken as a preventative measure, it is possible moral judgment may be impaired given reduced emotional connectivity. But what really is the greater danger to quality of care, the potential for PTSD development or an obstruction to moral judgement? How does the ethical landscape change when memory dampening is used prophylactically instead of reactively, particularly in the medical field?

Moving on to the analysis in favor of memory dampening, let's predictably start with autonomy. As our healthcare system progresses towards an autonomy-focused model, we ought to thoroughly question inverse action plans. If effective memory dampening pharmaceuticals were to become available, how can anyone decide for someone else whether or not a traumatic memory is allowed to plague him/her? PTSD can derail and even end lives, as evidenced by the well-established link between PTSD and increased risk of suicidal ideation (Lutwak and Dill 2017). With that in mind, how could an individual not be allowed to write the script of their own destiny, unencumbered by mental anguish? While memory dampening protestors often cite a threat to identity, traumatic

memories and PTSD demonstrably endanger individuality and personality (Burnos and Bargiel-Matusiewicz 2018). If both memory dampening and PTSD can alter identity, the input of autonomy must be the deciding factor in our moral calculus.

While memory alteration stirs up a hornet's nest of controversy in the context of memory dampening, where are the critics of psychotherapy? Often aiming to alter memory and proven to affect brain chemistry (Levy-Gigi et al. 2013), psychotherapy is an almost ubiquitously-accepted practice. We seem to commend memory modulation until pharmaceuticals become involved. In an attempt to justify this perspective, memory dampening opponents might state, "But there are ethically-relevant differences between talking with a patient and administering medicine." Well there are at least 2 distinctions, but they both bolster continued memory dampening research. First, CBT for PTSD usually lasts 8-12 weeks and is often cost prohibitive (many insurance plans neither cover psychotherapy nor behavioral medicine) (Hofmann et al. 2012). Memory dampening drugs would provide an expedited intervention process while being more affordable. Second, memory dampening can address the root cause of PTSD and potentially prevent the disorder's formation while CBT's use is restricted to a reactive fashion. While it may appear an oversight to play down the pertinence of drug side effects, there is simply not much to discuss. Even when compared to the relatively benign side effects of paroxetine and sertraline (Otto et al. 2011), propranolol presents minimal risk. In 1-10% of individuals taking the drug, the mild side effects of sleeping disturbances, transient fatigue, and cold extremities manifest (Steenen et al. 2016).

Not only is talk therapy almost incontestably permissible but FDA-approved drugs for treating PTSD have more serious side effects than propranolol. Barring newfound side effects of propranolol or other drugs to be developed, psychotherapy and memory dampening ought to be on an even playing field in terms of ethical deliberation. However, just as CBT has adapted in recent years (Blease 2015), memory dampening would require a rigorous informed consent process. While this might sound obvious, informed consent merely connotes signing a piece of paper for the average patient. A proper informed consent process ought to ensure with that signature comes a thorough understanding of the full breadth of risks/benefits. Practically-speaking, the informed consent process in psychotherapy is less challenging as an individual may continue to learn about the intervention throughout multiple sessions and can opt-out at any time. The fact that memory dampening pharmaceuticals may work with a single dose adds pressure to the process. Further, there is a potential time-sensitive facet, e.g. initial studies with propranolol demonstrated the need for administration within hours of a trauma (though more recent research points to an ability to exploit the fragility of recalled

memories without a steadfast time constraint - that propranolol could weaken emotional memories if PTSD patients took the drug after conjuring up the details of a painful experience (Brunet et al. 2011)). The gravity of a sufficient informed consent process for memory dampening must not be understated in the argument that it be included as an ethically-justified vehicle of memory modulation.

At the hub of arguments both for and against memory dampening is regulation. Without provisions, memory dampening cannot be permitted. If individuals took the drugs without a comprehension of their effects, which informed consent should counteract, a person's personality may be unknowingly at risk. But what if regulation ensured only those wanting to diminish the emotional strain of memories for medical reasons were candidates? Doesn't this transform the ethical debate? I argue it does. If an individual is seeking to reclaim his/her identity following a traumatic event, the pharmaceuticals must only be seen in a positive light. However, an individual requesting memory dampening in an attempt to alter his/her identity without therapeutic intent must not have access to the drugs. But isn't that contradictory to my sentiment that personal identity is up to the person? Superficially yes, but in the correct context no. Brain chemistry-modifying agents are typically prescription-only. We do not offer these drugs to individuals without a clinical reason. This is not because we are keen on distributive injustice but rather physicians hold an obligation to 'do no harm.' The same goes for memory dampening; it ought to be available to those needing it for its intended function and not those with drug abuse in mind.

While all potential reverberations necessitate rumination if memory dampening were to be determined safe/effective, ethical concerns must not preclude continued research efforts. As millions suffer from PTSD without successful therapies, advancements in our understanding of prospective treatments is critical. Given memory dampening's demonstrated promise to date, we owe it to our military veterans and all those suffering to soldier on. The key caveat for memory dampening's ethical defensibility is regulation. But can't we regulate just like any other drug while encouraging safe application? Put simply, we must not deny individuals the lives they were meant to have before being afflicted by horrible experiences. We must press forward with memory dampening research while acting in accord with the multitude of ethical considerations.

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