

**Case Report**

# A Case Report of Behavioral Improvements in a Young Adult with Autism Spectrum Disorder Using Topically Applied Glutathione

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## Abstract

**Background:** Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by impaired social communication and repetitive behaviors. Emerging evidence suggests oxidative stress and glutathione (GSH) imbalance may contribute to ASD pathophysiology.

**Case presentation:** We report the case of a 22-year-old male diagnosed with ASD in childhood, presenting with persistent social communication difficulties and anxiety-related behaviors. The patient was administered transdermal glutathione using a cyclodextrin-based nano-carrier beginning in December 2023.

**Intervention and outcomes:** Behavioral changes were reported within one week of initiation, including reduced anxiety, improved social engagement, and increased daily functioning. A temporary relapse occurred following discontinuation, with improvement upon re-initiation. Observations were primarily based on caregiver reports.

**Conclusion:** This case suggests a potential association between transdermal glutathione and behavioral changes in ASD. However, due to the observational nature and lack of objective measures, further controlled studies are required.

## Introduction

Autism spectrum disorder (ASD), as the name implies, does not have a specific cause, and its manifestations are heterogeneous [1,2]. Through its website, the Centers for Disease Control (CDC) presented a brief overview of ASD [1]. It also noted that ASD is not diagnosed with a blood test, but with behavioral abnormalities, which may be present in the first 12 months of life or not until adolescence [3]. As children with ASD become young adults, they may have difficulty maintaining friendships, communicating with peers, or interacting with adults. They may also present with concurrent anxiety, depression, or attention-deficit/hyperactivity disorder (ADHD). Typically, persons with ASD have problems with social communication, and restricted or repetitive behaviors or interests [1,2]. The significance

of glutathione (GSH) in ASD has been presented [4-6]. They described the role of GSH in reversing oxidative stress and neuroinflammation that results from redox imbalance [6,7]. Specifically, the ratio between GSH and its reduced form, GSSH, is significantly different between persons with ASD and normal individuals [4,6]. OS, in response to environmental exposure, is associated with essentially every human disease. The issue is whether OS merely a marker of a disease process or is instrumental in its ongoing pathophysiology. Current treatments of ASD include psycho-social interventions and targeted pharmacologic therapies that address associated comorbidities (eg, depression, anxiety, ADHD, irritability and aggression, and sleep difficulties). Notably, pharmacologic therapies do not address the core diagnostic symptoms of ASD [8,9].

### More Information

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This case report presents evidence of a significant positive response of a young adult with ASD after receiving GSH directly by delivering it transdermally via a nano-carrier,  $\gamma$ -cyclodextrin. (Patel) The index patient, B.W., was born on 12/5/2001 [10,11]. He was diagnosed with ASD by a Psychologist at six years of age upon recommendation of his teacher for evaluation. At that time, he had trouble speaking in complete sentences [2,3].

With his father's approval, he started using GSH on 12/2023 with noticeably improved behavioral changes within a week. However, he had an unexpected relapse 3 weeks later. This was eventually determined to be a result of discontinued use after a month by B.W. due to being disturbed by the unpleasant odor of the compound (which is the "rotten egg" smell from the sulfhydryl moiety of GSH) [12]. His father explained that it was from the compound. Once he accepted its origin, and that the odor disappears a few minutes after its application, he fully embraced its use, and his positive response returned as messaged by his father in March, 2024.

The following descriptions of B.W.'s behavioral improvements are the verbatim secure messages sent from his father.

September, 2024: (My son) has improved so much. He has fewer anxiety attacks and controls himself very well. He engages in conversations without hesitation when someone approaches him to speak with him and fellowships, referencing the Holy Bible. (My son) also shares about the scriptures from the Sermons preached on that day. Truly remarkable a product.

January, 2025 (My son) is more responsible. With his Grandma, they engage in conversations, and he helps her with snacks, taking her to the car safely and back into the house. They go for walks and converse a lot.

He takes our dog out, and he likes to play with him a lot and picks up after the dog. He takes out the trash from the house and also takes it out to the curb. He washes the dishes and puts them away without being told. What a plus!

(My son) He is very humble and extremely kind. He apologizes a lot even when he doesn't have to. He stays away from confrontations, keeps quiet, and asks later how he could help. He repeats to himself often, and when he's thinking he mumbles to himself. Thank you tons for this spray!!

This case report aims to describe the clinical course and observed behavioral changes in a young adult with Autism Spectrum Disorder following the use of transdermal glutathione, and to explore its potential role in modulating ASD-related symptoms [4,6,7,13].

### Clinical follow-up and observations

B.W. DOB 12/5/2001

5/16/24:

### ADDENDUM

1/13/2025

Per his father:

"He's more responsible. With his Grandma, they engage in conversations, and he helps her with snacks, taking her to the car safely and back into the house. They go for walks and converse a lot.

He takes our dog out, and he likes to play with him a lot and picks up after the dog. He takes out the trash from the house and also takes it out to the curb. He washes the dishes and puts them away without being told. What a plus!

(My son) He is very humble and extremely kind. He apologizes a lot even when he doesn't have to. He stays away from confrontations, keeps quiet, and asks later how he could help.

He repeats to himself often, and when he's thinking he mumbles to himself.

Today, he'll start spraying 3 pumps 3X per day on his chest as you have suggested. I will update you when I can.

Thank you tons for this spray!!

Father's assessment 10/2024: Brandon has been utilizing Glutaryl 2X/day. He has improved so much. He has fewer anxiety attacks and controls himself very well. He engages in conversations without hesitation when someone approaches him to speak with him and fellowshipping referencing the Holy Bible. Brandon also shares about the scriptures from the Sermons preached on that day. Truly remarkable a product.

7/2024: Brandon has been utilizing Glutaryl 2X/day. He has improved so much. He has fewer anxiety attacks and controls himself very well.

He engages in conversations without hesitation when someone approaches him to speak with him and fellowships, referencing the Holy Bible. Brandon also shares about the scriptures from the Sermons preached on that day. Truly remarkable a product.

B.W. had significant improvements in his communication skills and social interactions. However, as a single observational case study, there are many unanswered questions that require studies in future large prospective clinical trials. Among them are 1) Does GSH modify core ASD behavior or its comorbidities? Both? 2) What additional effect can GSH have if started in early childhood? 3) What is the optimal dose of GSH? The GSH-cyclodextrin complex has several advantages. First, it delivers GSH directly (unlike N-acetyl cysteine that requires enzymatic conversion into GSH). It avoids the degradation of oral GSH and the high cost of intravenous GSH. It is not a prescription product. Finally, it has a favorable safety profile,



as shown by its commercial use as a dermatologic product for over 10 years. (Patel) Furthermore, GSH is present in our bodies as an abundant natural anti-oxidant and cyclodextrin itself has a Generally Regarded as Safe (GRAS) status with the Food and Drug Administration. Safety is paramount if it is to be used in children.

3/2024: F84.0 Autism (primary encounter diagnosis) - stated improvement in behavior per father started 12/2023.

## Discussion

This case report describes observed behavioral changes in a young adult with Autism Spectrum Disorder (ASD) following transdermal glutathione therapy. Glutathione plays a critical role in cellular redox balance and has been implicated in neuroinflammatory and oxidative stress pathways associated with ASD [4,5-7]. Previous studies have suggested that individuals with ASD may exhibit altered glutathione metabolism [4], potentially contributing to neuronal dysfunction [6,13-18]. The observed improvements in this case may be related to modulation of oxidative stress; however, causality cannot be established [7]. Several limitations must be acknowledged. First, this is a single case report with no control group. Second, outcomes were based solely on caregiver-reported observations without objective clinical or standardized behavioral assessments. Third, placebo effects and observer bias cannot be excluded. Despite these limitations, this case highlights the need for further investigation into glutathione-based therapies in ASD through well-designed clinical trials.

## Conclusion

This case report describes observed behavioral improvements in a young adult with Autism Spectrum Disorder following the use of transdermal glutathione. The findings suggest a possible association between glutathione supplementation and changes in social interaction, anxiety, and daily functioning. However, given the single-case design, reliance on caregiver-reported outcomes, and absence of standardized assessment measures, no definitive conclusions regarding efficacy or causality can be drawn. The observed improvements should therefore be interpreted with caution. Further research, including controlled clinical trials with objective outcome measures, is necessary to determine the therapeutic potential, optimal dosing, and long-term safety of transdermal glutathione in individuals with Autism Spectrum Disorder.

## Ethical statement

**Ethical approval and consent:** The informed consent was obtained from the patient's legal guardian for publication of this case report and any accompanying data. All identifying information has been anonymized to protect patient confidentiality.

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