

**Case Report**

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**Significant health improvement in a diabetic patient with brain tumor and suspected echthyma gangrenosum: A case report****Anwar Ul Haq<sup>1\*</sup>; Muhammad Esa<sup>1</sup>; Jian Wang<sup>2</sup>; Urooj Anwar<sup>3</sup>**<sup>1</sup>Department of Pharmacy, SBB University, Sheringal Upper Dir 18800, Pakistan.<sup>2</sup>Chongqing College of Traditional Chinese medicine, Department of Chinese Materia Medica No. 61 Puguobao Road, Bishan District, Chongqing 402760 Chongqing China.<sup>3</sup>Department of Pharmacy, University of Peshawar, Peshwar, Pakistan.**\*Corresponding Author: Anwar Ul Haq**Department of Pharmacy, SBB University, Sheringal  
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**Abstract**

This case report presents the remarkable health improvement observed in a 52-year-old known case of male diabetes mellitus (DM), who is diagnosed recently with a brain tumor and suffered from tumor-induced depression, radiation induced suspected Echthyma Gangrenosum (EG). Insulin dependent patient is treated with standard pharmacotherapy, besides radiotherapy for tumor, resulted in a suspected development of EG patches on the forehead. The patient's own addition of complimentary treatment with *Withania coagulans* (WC) not only prevented the further growth of EG patches, but significant down-turn in the glycemic level, along with substantial improvements in other symptoms of loss of libido, short memory, anger and mild hypertension, suggesting a potential complementary therapeutic option for such complex medical conditions.

**Keywords:** *Withania Coagulans*; Brain Tumor; Echthyma Gangrenosum; Diabetes Mellitus; Gamma Knife Radiosurgery.

**Introduction**

Brain tumors are among the most challenging medical conditions to manage, often associated with various complications including depression [1]. Depression in patients with brain tumors can significantly affect their quality of life and overall prognosis [2]. Diabetes may have more chances to develop brain related tumors, and thereby add another layer of complexity [3]. WC (Figure 1), commonly known as 'Paneer Dodi' or 'Indian Rennet,' is a medicinal plant traditionally used in various ailments [4], previous studies on its neuroprotective and antidepressant properties, makes it a promising candidate for adjunctive therapy in such cases [5]. It has been traditionally used in various systems of medicine for its therapeutic properties. It has its potential health benefits according to available scientific evidence [6]. It is rich in phytochemicals including

Withanolides that are steroidal lactones known for their diverse pharmacological activities [7]. It contains several withanolides, similar to those found in *Withania somnifera*, such as withaferin A, withanolide A, withanolide B, and withanosides [8]. WC contains alkaloids, nitrogen-containing compounds with potential pharmacological effects [7]. It has been reported to contain flavonoids, which may contribute to its antioxidant activity [9]. It also possess tannins, which could contribute to its therapeutic effects [6]. WC contains saponins, glycosides with various biological activities, including anti-inflammatory and immunomodulatory effects along with antidiabetic effects. Studies in rat models have shown that WC extract may help reduce blood glucose levels and improve insulin sensitivity [10]. The anti-inflammatory properties, attributed to its withanolide content, is due to its inhibition of pro-inflammatory cytokines

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and mediators. WC modulates the immune response by regulating cytokine production and enhancing immune cell activity. It has been studied for its potential in boosting the immune system and combating infections. Preliminary studies suggest that WC may have anticancer properties, including anti-proliferative and apoptosis-inducing effects against various cancer cell lines. However, further research is needed to elucidate its mechanism of action and therapeutic potential in cancer treatment [11]. WC holds promise as a therapeutic agent for various health conditions, including bacterial infection, tumors [12], type 2 diabetes [13,14], inflammation, free radical scavenging, oxidative stress-related disorders [14], and immune-suppressant [15]. Further studies, including clinical trials, are warranted to validate its efficacy, safety, and therapeutic potential in humans.

### Case presentation

A 52-year-old male, known case of DM, presented with complaints of headache for 3 months and impairment of memory for 2 months. Patient has no history of surgery, chemotherapy and radiation therapy. On clinical examination, patient has affected recent memory & mild dysphasia. MRI brain (Figure 2) dated July 7, 2023, shows a well-defined broad based extra axial altered signals intensity lesion in the left temporal region with enhancement on post contrast images with enhancing dural tail suggestive of meningioma. Risk of Gamma Knife Radiosurgery (GKSRS) have been explained. Written and valid consent obtained to proceed at DOW University Hospital, Ojha campus Karachi. The patient was brought to gamma knife suit, where thermoplastic mask was applied to the head of patient. The MRI images were shifted to the GK planning workstation. Skull image drawn and gamma dose plan was made for the target as prescription of 5 Gy x 5 fraction @ 50% (25Gy) and volume 48.208 cm<sup>3</sup>. Multiple isocentres with 4, 08 and 16 mm collimator were used. The dose was consulted with Radiologist Oncologist and was delivered with leksell Gamma Unit ICON. The procedure went smooth and the mask was removed. Next followup of MRI suggested after 6 months, along with medications including tablet Dexamethasone 0.5 mg after meal ( 4+4+4 for 1 week, then 3+3+3 for 1 week, then 2+2+2 for 1 week, capsule Omeprazole 20 mg (1+1 before meal for 4 weeks), continue tablet Epival 500 mg (1+1+1), continued tablet Levetiracetam 500 mg (1+1+1). A follow up comparative study with a new MRI was made on November 15, 2023 that presented significant regression in the targeted lesion when compared with previous one, consistent with ongoing control of tumor. Patient consulted the GKSRS center for the 2nd follow up on January 19, 2024, presented further regression in the lesion consistent with tumor control. Advice for next follow up after 3 months with PET CT scan and medications including Dexamethasone 5 mg (3+3+3 for 2 weeks, then 2+2+2 for 2 weeks, then 2+0+2 for 1 month, tablet Omeprazole 40 mg (1+0+0), continued tablet Epival 500 mg (1+1+1 for 3 months), tablet Lumark 500 mg (1+ 1+1 for 3 months). A black patchy scar of 4.5 mm (Figure 3a) over the left eye brow appeared, suspected to be echthyma gangrenosum (EG) after 4 weeks of 2nd radiation, while another small one of 1mm size (Figure 3b) after 6th week over the forehead. EG is a well-recognized but uncommon cutaneous infection classically associated with *Pseudomonas aeruginosa* bacteremia [16]. EG usually occurs in patients who are critically ill and immunocompromised. A 21-year-old woman with acute myeloid leukemia

who was undergoing induction chemotherapy presented with a lesion on her left knee that had developed 5 days after initiation of therapy. A physical examination revealed a 2 cm hemorrhagic patch with an erythematous border [17]; it was first described in association with *Pseudomonas* septicemia by Barker in 1897 and was later given the name “ecthyma gangrenosum” by Hitschmann and Kreibich [18]. To enhance further health improvement in DM and symptoms reduction, the patient expressed interest in exploring complementary therapies for himself. A plant fruits, WC was purchased and collected from Kam Sarobi (Figure 4), V4P6+45G, Esha-Razmakroad, Sarobi, North Waziristan Agency, Khyber Pakhtunkhwa, Pakistan (32.88542, 70.11063). With informed consent, he started taking WC after pharmacist intervention of soaking of 10-11 dried fruits, each with an average weight of 45 to 55 mg of WC in potable water to make aqueous extract at a dose of 500 mg twice daily alongside his existing treatment regimen. Regular follow-ups were conducted to monitor the patient’s progress.



Figure 1: Withania coagulans dried fruits.

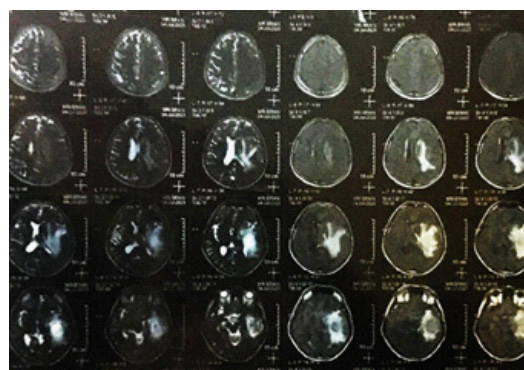


Figure 2: MRI scan on July 7th, 2024.



Figure 3a: 1<sup>st</sup> EG cell.



**Figure 3b:** EG cell.



**Figure 4:** Plant (WC) collection area.

**Outcome:** Remarkable improvements were noted in the patient's condition following the initiation of standard treatment and WC supplementation. Within four weeks of treatment, the patient reported a significant reduction in symptoms, evidenced by improved mood, increased interest in activities, and better sleep patterns. Moreover, the patient experienced consistent sugar drop to 70 after taking the prescribed medications and WC (for 02 weeks only). No further growth in the appeared EG. The hair fall at the radiation site showed regrowth. An improvement in loss of short memory is also observed along improvement in libido.

### Discussion

The observed improvements in the patient's condition particularly in diabetes and preventive cancer and/ or tumor, suggest a potential role for WC in the management of depression associated with brain tumors, especially when conventional therapies are insufficient. WC is rich in bioactive compounds such as withanolides, which exhibit neuroprotective and anti-depressant properties through various mechanisms, including modulation of neurotransmitter levels and reduction of oxidative stress.

### Conclusion

This case report highlights the significant improvement observed in a DM patient with a brain tumor and tumor-induced depression following supplementation with WC crude aqueous fruit extract. Further research, including randomized controlled trials, is warranted to elucidate the efficacy and safety of WC as an adjunctive therapy in similar clinical scenarios.

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