

Tempol Treatment of Covid-19

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Introduction: Now the subject of over 2000 publications, the SOD-mimetic nitroxide spin-label Tempol is effective in the experimental treatment of many human and animal diseases, while showing minimal toxicity. See: www.tempol.info. Supporting a role for redox signaling in its MOA, Tempol modulates numerous redox-dependent cellular messenger systems. These include BRCA1, CtBP1, p53, PARP, HIF-1 α , HIF-2 α , VEGF, IL-6, BARD1, RAD51, uPAR, NF- κ B, and mGluR's. Significantly, the initial therapeutic use of Tempol involved treatment of alopecia (US Patent #5728714, priority date,1985). One inspiration was the mid-1970's discovery that Orgotein, the pharmacological formulation of bovine liver SOD1, inhibits hair shedding (“effluvium”) in experimental diabetes in rodents (Fig 1). This finding implies a role for redox-signaling in both diabetes and in the hair cycle, a good general model for redox modulation of cellular processes (1,2). Tempol is similarly reported to ameliorate radiation-induced hair loss in humans, a form of anagen effluvium (3). We report the apparent-efficacy of Tempol in the treatment of early Covid-19 (SARS-CoV-2 infection), supporting a key role for oxidative stress and redox signaling in this disease and possibly explaining the common association of Covid-19 with alopecia.

Case Report: The patient, who is the author, experienced sudden-onset severe headache accompanied by marked nausea and vomiting, pharyngitis, upper respiratory congestion, fever, chills, weakness, malaise, and mild pulmonary congestion. Provisional-diagnosis was Covid-19. For some time, patient has been taking Tempol PO intermittently as cancer prophylaxis, to prevent and shrink surgical scarring, and for its putative antiaging effects-- in toxicity studies, Tempol-treated animals live longer than controls. However, concerned that it would interfere with their action, patient discontinued Tempol following vaccination with tetravalent Fluzone and again for Zostavax, respectively six and two weeks before.

Treatment: Nausea and vomiting continued without respite over several hours. Antinausea tablets were twice regurgitated intact. Accordingly, treatment was initiated with 30 mg Tempol PO as the hydroxylamine (Tempol-H) in a 6% water solution containing 100 mg vitamin C. Patient kept this down and did not vomit again. 1000 mg of vitamin C and acetaminophen for pain and fever were administered when vomiting stopped. Intranasal treatment was also initiated with insufflation via a cotton swab soaked in the above medication or a 3% Tempol gel 1-2/day, along with 1% Tempol-zinc sulfate gargles for pharyngitis. This was followed by similar doses of Tempol-H three and six hours later, repeated BID for the next ten days. On days 2-3, treatment was briefly initiated with hydroxychloroquine, zinc, etc., and then stopped.

Results: Within 30-60 minutes post-Tempol-H, vomiting ceased, nausea and headache eased significantly, and the patient felt objectively better. Nasal congestion and pharyngitis also significantly cleared after local treatment. By days 4-5, remaining symptoms were mild nasal congestion, pharyngitis, malaise, and an arguable mild encephalopathy (mainly, vivid dreaming and “spaciness”). Patient was essentially asymptomatic by day 8, except for very mild residual fatigue and malaise. As expected, PCR at day 10 was negative. Although the diagnosis is reasonably secure, subsequent antiviral IGGs were also negative, possibly secondary to the putative antiinflammatory effects of Tempol.

Discussion: The usual objections to N=1 case-reports apply. However, the almost immediate relief of GI and oropharyngeal symptomology was striking and may reflect some direct action of Tempol on

virus-infected gastric and respiratory mucosa. Minimally, at these doses, Tempol may be used with relative safety in presumptive early Covid-19 with arguable effectiveness. Further supporting safety, author (a board-certified medical toxicologist) has used Tempol intermittently for roughly two decades with minimal side-effects for treatment of (e.g.) fibrocystic disease of breast (viz, pulmonary fibrosis (2)), respiratory infections, and for cancer prophylaxis. Covid-related oxidative stress may also relate to the high incidence of post-infection hair loss in Covid-19 patients, to the high incidence of androgenic alopecia in Covid-19 patients (4-6), and to the *in vitro* efficacy of the antioxidant hair-loss-treatment agent Cepharanthine in Covid-19(7). Finally, Orgotein once had regulatory approval in several European countries for (e.g.) Peyronie's disease, and interstitial cystitis and is another repurposing candidate for treatment of Covid-19.*

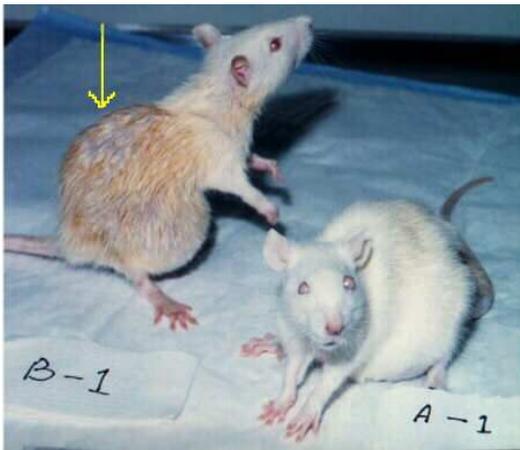


Figure 1, Effect of Orgotein (Bovine Liver SOD1) on Diabetes-induced Hair Loss: 5 pairs of streptozotocin-induced diabetic rats, matched for blood sugars over 600 mg%. Rat A-1 was injected with Orgotein (bovine SOD1) in an effort to prevent diabetic cataracts. Clearly, this didn't work-- diabetic cataracts are readily visible. Unexpectedly, although profoundly diabetic, he did not show coat shedding, as did his matched control (B-1) on the left. The arrow points to an area where the hair has fallen out and skin is showing through. Brown color is secondary to diarrhea. Orgotein also prevented this.

COI: Patent pending. Author also has other IP in this area.

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Misc:

[Clinical Trials](#) using Tempol to treat Covid-19 are planned. I have no connection with this company.

[A recent article in JAMA](#) reports Fluvoxamine ameliorates early Covid-19 Symptoms. The proposed mechanism of action involves the S1R-IRE1 pathway. Tempol [also modulates](#) this system. Other possible MOA's involve the ACE2 viral binding site and its various actions. E.g., <https://pubmed.ncbi.nlm.nih.gov/23160880/> .

* As always with therapeutic agents, speculation is just that, nothing is obvious, and similar drugs may have wildly-differing actions.