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Short Communication

Sub-micron salt against Viruses

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INTRODUCTION

The ideal treatment for the Covid 19 virus is a vaccine but these need updating to work against new variants. This note, written by an engineer with no medical qualifications beyond a recovery from a mild Covid infection, suggests a parallel and complementary treatment.

In 1843 a Polish doctor Felix Boczkowski noticed that people working in salt mines never had any lung problems. If you put 'Polish doctor salt mines' into Google you will get a deluge. Asthmatic children in Eastern Europe are given breathing exercises in salt mines...

Dr Mervyn Singer in a personal communication says that the intensive care group at UCL uses saline nebulisers in critical care to humidify lungs.

Air over land will contain 1000 or more aerosol particles in each cubic centimetre which are large enough to trigger the formation of a cloud drop. Standing on a beach with breaking waves can produce a similar concentration of salt particles. Perhaps this was why Victorian doctors would prescribe sea air. In some polluted cities the aerosol number will reach 5000 per cubic centimetre with some nasty ones from Diesel exhaust, human skin and fragments of tyres and car brake linings. There should be few objections about getting 1000 salt particles of salt per cubic centimetre into people's lungs. What we need is ways to get the right amount of salt in the right size to all the people who need it.

The Covid 19 virus has a diameter of 120 nanometres so its mass would be about 10 -15 gram. We want to get a reasonable fraction of salt particles into the smallest lung cavities, which are called alveoli. Their internal diameter is about 200 microns increasing when we breathe.

This means that the viruses can very easily get inside the alveoli without too many getting stuck on the walls. This point to an upper limit for most of the salt to get deeply in if we can use a hunting analogy we want a shot gun not a rifle with bird shot not buckshot. Following the gargling results the ones that stuck to the walls of large lung passages might still is doing a useful job.

The most basic way to get salt into lungs is with a salt pipe, available from Amazon. These consist of a ceramic container filled with quite large, ~5mm diameter crystals, kept in the container between two grids with smaller holes, ~2 mm. shaking the container will grind small fragments from the large ones. Sucking air through the container as hard as you can move small salt fragments into your lungs. You can just about taste the result. The makers recommend three, five-minute sessions every day. We could easily afford to give a salt pipe to every front-line medical worker, to people like bus drivers with high exposure risk and to all elderly people with a pre-existing medical condition.

A more targeted application would be to insert a salt container into the airline supplying oxygen to patients in intensive care units. Shaking could be done with a small electric motor stirring or tumbling the crystals or an electromagnetic vibrator. This would allow a continuous salt supply which could be controlled by the fraction of gas flow diverted through the salt. It could alternate with humid air.

It is even possible to use the treatment for large populations provided that there were no objections to involuntary, uninformed medication. This would involve the use of salt particle generation which has been designed for reversing global warming by increasing cloud reflectivity proposed by John Latham to exploit the Toomey effect. In contrast to the wide range of particle sizes which would suit medical use we think that a narrow size spread is desirable for climate control. The present ideal is thought to be 0.8 micron drops of well-filtered sea water which would evaporate to leave salt residues with a mass of about 10 -14 grams, ten times the mass of a Covid 19 virus. After filtration through filters (originally designed to remove 29 nanometre diameter polio viruses in drinking water) the 3.5 % solution would be pumped through nozzles etched in a silicon wafer. At this size evaporation would be rapid but the Stokes equation with the Cunningham correction predicts that falling speed for this size in still air would be negligible. The entire London underground system could be treated to 1000

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particles per cubic centimetre with 20 grams of salt, the Wembley stadium with 10 grams and the Albert Hall with only 1 gram. We could have individual generators on aircraft and trains and treat entire hospitals.

High payload (100 kg) drones will soon be available from Flowcopter. They could fly along 180 degree arcs upwind of large cities to release salt to entire cities. A cylinder of air 40 kilometres in diameter and a kilometre high would need 12 tonnes. The site says that the UK uses two million tonnes of salt a year for clearing ice from roads.

It would be useful to measure the size spectrum of the particles in the air stream from a salt pipe. We need medical advice on the range of particle sizes and the opinion about dosage in oxygen streams. We should see if there is a lower incidence of infection in people who live near rough seas which can be separated from the difference in population density. Do frequent dinghy sailors have a lower risk? With numbers for good particle sizes we test various salt-crystal shaking mechanisms. We could issue salt pipes to medical staff, staff bus drivers and other vulnerable people and see if there is a detectable reduction of infection. Culture surfaces in a Petri dish could be exposed to salt spray through masks and then to a virus.

REFERENCES

1. Sancini G, Gregori M, Salvati E, Cambianica I, Re F, Ornaghi F, Canovi M, Fracasso C, Cagnotto A, Colombo M, Zona C. Functionalization with TAT-peptide enhances blood-brain barrier crossing in vitro of nanoliposomes carrying a curcumin-derivative to bind amyloid-β peptide. J Nanomed Nanotech. 2013; 4(3).
2. Nanjwade BK, Hundekar YR, Kamble MS, Srichana T. Development of cuboidal nanomedicine by nanotechnology. Austin J Nanomed Nanotechnol. 2014;2(4):1023.
3. Sanyal S, Huang HC, Rege K, Dai L. Thermo-responsive core-shell composite nanoparticles synthesized via one-step pickering emulsion polymerization for controlled drug delivery. J Nanomed Nanotech. 2011;2(7).
4. Singh K, Panghal M, Kadyan S, Chaudhary U, Yadav JP. Antibacterial activity of synthesized silver nanoparticles from Tinospora cordifolia against multi drug resistant strains of Pseudomonas aeruginosa isolated from burn patients. J Nanomed Nanotech. 2014;5(2):1.
5. Ghosh S, More P, Nitnavare R, Jagtap S, Chippalkatti R, Derle A, Kitture R, Asok A, Kale S, Singh S, Shaikh ML. Antidiabetic and antioxidant properties of copper nanoparticles synthesized by medicinal plant Dioscorea bulbifera. J Nanomed Nanotech. 2015 (S6): 1.
6. Ramos J, Taylor D, Rege K. Gold nanoparticle mediated photo-chemotherapy. J Nanomed Nanotech. 2012;3(8):9.
7. Mahna N, Vahed SZ, Khani S. Plant in vitro culture goes nano: nanosilver-mediated decontamination of ex vitro explants. J Nanomed Nanotech. 2013;4(2):3.
8. MJ N, Nagarajan R J Nanomed Nanotech.