

## CHOLERA CAN BE CONQUERED

THE UNITED STATES NAVY presents  
MEDICINE IN ACTION  
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CHOLERA CAN BE CONQUERED

*India, land of mystery and enchantment. Land of ancient traditions and majestic temples, of beast-infested jungles and sacred rivers, yet with all our ancient culture, land of pestilence and death. For more than 3,500 years Hindu victims of viral epidemics such as cholera have been carried to burning ghats, their bodies wrapped in dye-stained robes, their feet and faces anointed with pungent oils, and then consigned to the flames of the funeral pyre. From the dawn of recorded history, this ritual has remained almost the same. An unburned portion of the cholera victim's body, which the Hindus has believed to be the navel, is wrapped in mud and then flooded away on the sacred waters of the Ganges to speed the departed soul to another of its thousands of incarnations. Perhaps to become a crow, or even a mangy scavenger of the ashes of the dead.*

*One fifth of the entire human race lives in India, almost 400 000 000 people: Hindus, Mohammedans, Muslims, Buddhists, Sikhs, Jains, Animists, Parsis. Although their religious beliefs differ widely, their living habits are much the same. From squalid huts by stagnant pools in the country to the teeming streets of the cities, the nearest sacred water serves for dishwashing, clothes-washing, body-washing and drinking. And humans and animals alike use it for natural elimination.*

*In Calcutta for example, where the banks of the Hooghly River are aligned in septic infusion with sewers and public baths, some of the vibrio-infested river water is pumped unchlorinated to public fountains on the curbs of the city streets. Here too hand pumps are fed from wells only 20 feet deep. Contaminated with surface filth, the water seeps back into these wells to spread its pestilence over and over again. Vast quantities of food are displayed and even cooked along the streets where flies are free to drag their germ-laden feet over human food after stalking over rotting piles of street filth. It's no wonder that the average Indian has accepted the scourge of cholera in hopeless resignation.*

*Only when the monsoons of summertime bring their 10 weeks of almost steady downpour, only then are the streets washed and the streams and rivers made to run with somewhat fresher water. Only then does the dread cholera subside. But during the rest of the year, the menace is ever present, endemic, ready to strike without warning at civilian or even military personnel.*

*That is why early in 1945 the United States Navy, putting medicine in action, sent epidemiology unit no. 50 to Calcutta, the cholera capital of India. The job in official Navy parlance was to "conduct a controlled experiment to determine the value of chemotherapy in the treatment of cholera". In plain English, the job was to try to find a way to beat the cholera bug.*

*True to Navy tradition, unit no. 50 trained its medical guns on the enemy and sank same and wrote a dramatic new chapter in medical history.*

*Standard bacteriological methods were followed in the typing of the specific cholera vibrio causing the then current epidemic in Calcutta. Stool cultures taken by the rectal swab method for convenience and speed were streaked out on bile-salt agar plates and incubated for 12 hours. The cholera strains were then typed by the agglutination method. The specific agglutinating sera themselves were made by building up the immunity of rabbits until their blood had sufficient titer or strength to agglutinate cholera organisms. 95% of the vibrio present in this epidemic were found to be Ogawa. 2% were non-agglutinable, yet to be classified. The remainder, only 3%, were Inaba. But patients harboring this strain were more acutely ill.*

*Cholera is an infectious disease without fever as the charts of patient after patient indicated. When there are complicating diseases, the temperature does rise however. The signs and symptoms of cholera are usually quite typical unless they are affected by the presence of other diseases such as pneumonia. Prostration is followed always by general emaciation, by sunken eyes, sunken cheeks and pinched noses, and often by a rigor or tremors, especially of the lower extremities. This is due of course to the most dangerous of all the effects of cholera: dehydration, which slowly thickens the blood through loss of fluid until circulation is retarded to the final point of failure (...), and often in only 24 hours. The general emaciation and apathy is accompanied by a wrinkling and drying of the skin, especially of the hands and feet, the so-called "washerwoman's hands and feet". This dehydration results from the almost constant painless purging and vomiting. The bowels act from 20 to 30 times a day. Copious rice water stools drain the body fluids away. Projectile vomiting occurs with regularity until the patient is wracked with fruitless spasms of nausea. By this time, prostration and shock are almost complete and death is very near. An extreme effect of dehydration and circulatory failure is the occasional appearance of dry gangrene which, unless body fluids and circulation can be restored, progresses rapidly in a few days until arterial blockage develops and eventually amputation is the only recourse.*

*The classic Indian method of restoring body fluids in the past has been the administration of coconut milk, which also provides some slight nourishment. In more recent years, saline solution has been added, injected into the collapsed veins of the arm to thin the "currant jelly" blood. This usually gives relief, but frequently it is only a temporary relief from which the patient relapses into shock. When this historic work began, at least 15 out of every 100 cholera patients were carried to the burning ghats.*

*Penicillin proved quite effective in combating the cholera vibrio and it had the advantage of quickly producing a general feeling of well-being in the patient. However, sulfadiazine administered orally was found to be far more effective than penicillin. But even so, recovery was not assured. Patients continued to succumb to the complications and shock of circulatory failure resulting from dehydration.*

*Something was lacking in the method of treatment which conquered the disease but lost the patient. Restoration of body fluids by mouth and by injection of saline and soda solution simply did not produce results.*

*It was then that the first attempt was made to restore circulation by reconstituting the blood so that medication could be tolerated. It was then that a simple expedient was tried, an expedient which had escaped medicine up to that point. Blood plasma was injected for the first time in medical history into the veins of a cholera patient. The results were miraculous.*

*These cholera cases had been conquered. Not one patient properly treated with plasma and sulfadiazine has since been lost.*

*Personnel of the Armed Forces can be protected by regular and careful methods of sanitation, by rigid control measures, such as laboratory control of the water supply, by careful and sanitary methods of food preparation and required use of official messes only. Screening of heads and similar protective measures along with booster immunization every six months will safeguard anyone, even in a cholera epidemic.*

*For hundreds of millions of the world's people and for service people who happen to contract the disease, there is certain recovery from cholera thanks to sulfa drugs and this new use of life-giving plasma.*

*This is "Medicine in action".*

THE END

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