


Ergotism

Ergotism	
<i>Classification and external resources</i>	
	
Advanced ergotism with gangrene	
ICD-10	T62.2 ^[1]
ICD-9	988.2 ^[2]
DiseasesDB	30715 ^[3]
MeSH	D004881 ^[4]

Ergotism is the effect of long-term ergot poisoning, traditionally due to the ingestion of the alkaloids produced by the *Claviceps purpurea* fungus which infects rye and other cereals, and more recently by the action of a number of ergoline-based drugs. It is also known as **ergototoxicosis**, **ergot poisoning** and **Saint Anthony's Fire**. Ergot poisoning is a proposed explanation of bewitchment.

Causes

The toxic ergoline derivatives are found in ergot-based drugs (such as methylergometrine, ergotamine or, previously, ergotoxine). The deleterious side-effects occur either under high dose or when moderate doses interact with potentiators such as azithromycin.

Historically, eating grain products contaminated with the fungus *Claviceps purpurea* also caused ergotism.

Finally, the alkaloids can also pass through lactation from mother to child, causing ergotism in infants.

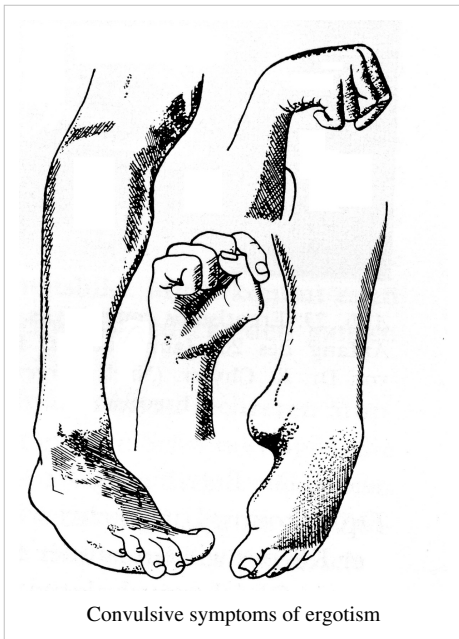
Symptoms

The symptoms can be roughly divided into convulsive symptoms and gangrenous symptoms.



Claviceps purpurea fungal sclerotia growing on barley

Convulsive symptoms



Convulsive symptoms of ergotism

Convulsive symptoms include painful seizures and spasms, diarrhea, paresthesias, itching, mental effects including mania or psychosis, headaches, nausea and vomiting. Usually the gastrointestinal effects precede central nervous system effects.

Gangrenous symptoms

The dry gangrene is a result of vasoconstriction induced by the ergotamine-ergocristine alkaloids of the fungus. It affects the more poorly vascularized distal structures, such as the fingers and toes. Symptoms include desquamation or peeling, weak peripheral pulses, loss of peripheral sensation, edema and ultimately the death and loss of affected tissues. Vasoconstriction is treated with vasodilators.^[5]

History

Epidemics of the disease were identified throughout history, though the references in classical writers are inconclusive. Rye, the main vector for transmitting ergotism, was not grown much around the Mediterranean. When Fuchs 1834 separated references to ergotism from erysipelas and other afflictions, he found the earliest reference to ergotism in the *Annales Xantenses* for the year 857: "a Great plague of swollen blisters consumed the people by a loathsome rot, so that their limbs were loosened and fell off before death."

In the Middle Ages, the gangrenous poisoning was known as *ignis sacer* ("holy fire") or "Saint Anthony's fire", named after monks of the Order of St. Anthony who were particularly successful at treating this ailment. The 12th century chronicler Geoffroy du Breuil of Vigeois recorded the mysterious outbreaks in the Limousin region of France, where the gangrenous form of ergotism was associated with the local Saint Martial as much as Saint Anthony.

According to Snorri Sturluson, in his *Heimskringla*, King Magnus, son of King Harald Sigurtharson, who was the half brother of Saint King Olaf Haraldsson, died from ergotism shortly after the Battle of Hastings.

The blight, named from the cock's spur it forms on grasses, was identified and named by Denis Dodart, who reported the relation between ergotized rye and bread poisoning in a letter to the French Royal Academy of Sciences in 1676 (John Ray mentioned ergot for the first time in English the next year), but "ergotism", in this modern sense, was first recorded in 1853.

Notable epidemics of ergotism occurred up into the 19th century. Fewer outbreaks have occurred since then due to rye being carefully monitored in developed countries. A severe outbreak of ergot poisoning occurred, however, in the French village of Pont-Saint-Espirit in 1951, resulting in five deaths.^[6] Paranormal researcher John Grant Fuller wrote about the incident in his book *The Day of St Anthony's Fire*.^[1]

There is evidence^[7] of ergot poisoning serving a ritual purpose in the ritual killing of certain bog bodies.^[8]



Ergot in barley

When milled, the ergot is reduced to a red powder, obvious in lighter grasses but easy to miss in dark rye-flour. In less wealthy countries, ergotism still occurs; an outbreak in Ethiopia occurred in mid-2001 from contaminated barley. Whenever there is a combination of moist weather, cool temperatures, delayed harvest in lowland crops and rye consumption, an outbreak is possible.

Poisonings due to consumption of seeds treated with mercury compounds are sometimes misidentified as ergotism.^{[9][10]} As Dr. Simon Cotton (member of the Chemistry Department of Uppingham School, UK) notes, there have been numerous cases of mass-poisoning

due to consumption of mercury-treated seeds.^[11]



Painting by Matthias Grünewald of a patient suffering from advanced ergotism from approximately 1512–16 AD

Salem witchcraft accusations

The convulsive symptoms that can be a result of consuming ergot-tainted rye have also been said to be the cause of accusations of bewitchment that spurred the Salem witch trials. This medical explanation for the theory of “bewitchment” is one first propounded by Linnda R. Caporael in 1976 in an article in *Science*. In her article, Caporael argues that the convulsive symptoms, such as crawling sensations in the skin, tingling in the fingers, vertigo, *tinnitus aurium*, headaches, disturbances in sensation, hallucination, painful muscular contractions, vomiting and diarrhea, as well as psychological symptoms, such as mania, melancholia, psychosis and delirium, were all symptoms reported in the Salem witchcraft records. Caporael also states there was an abundance of rye in the region as well as climate conditions that could support the tainting of rye.^[12] In 1982 historian Mary Matossian raised Caporael’s theory in an article in *American Scientist* in which she argued that symptoms of “bewitchment” resemble the ones exhibited in those afflicted with ergot poisoning.^[13]

The hypothesis that ergotism could explain cases of bewitchment has been subject to debate and has been criticized by several scholars. Within a year of Caporael’s article, the historians Spanos and Gottlieb argued against the idea in the same journal. In Spanos and Gottlieb’s rebuttal to Caporael’s article, they concluded that there are several flaws in the explanation of ergot poisoning as a cause of conditions associated with cases of alleged bewitchment. For example, they argued that if the food supply was contaminated, the symptoms would have occurred on a house-by-house basis, not just in particular individuals. Historian Leon Harrier has challenged this theory by claiming that even if supplies were properly cooked, residents suffering from stomach ulcers had a risk of absorbing the toxin through the stomach lining, offering a direct route to the blood stream. Being similar to Lysergic acid diethylamide (LSD), the chemical composition of the average human’s stomach would be too acidic for the ergot to survive, especially if the food was properly cooked, but if some residents were malnourished and suffering from bleeding stomach ulcers, there is valid reasoning to say that while most of the residents would not be affected by ingesting contaminated grains, a small percentage could have become infected, offering an explanation for why ergotism was never initially recognized. Harrier has even argued that the numbers could have been exponentially larger, possibly even the entire town, but due to the trials on bewitchment and heresy, and the fear of being accused and subsequently executed, few could come forward while suffering from legitimate medical conditions. Spanos and Gottlieb also state that ergot poisoning has additional symptoms not associated with the events in Salem and that the proportion of children afflicted were less than in a typical ergotism epidemic.^[14] The anthropologist H. Sidky noted that ergotism had existed for centuries before the Salem witch trials, and argued that its symptoms would have been recognizable during the time of the Salem witch trials.^[15]

References

- [1] <http://apps.who.int/classifications/icd10/browse/2010/en#/T62.2>
- [2] <http://www.icd9data.com/getICD9Code.aspx?icd9=988.2>
- [3] <http://www.diseasesdatabase.com/ddb30715.htm>
- [4] http://www.nlm.nih.gov/cgi/mesh/2013/MB_cgi?field=uid&term=D004881
- [7] .
- [8] .
- [9] .
- [10] .
- [11] .

Article Sources and Contributors

Ergotism *Source:* <http://en.wikipedia.org/w/index.php?oldid=540748884> *Contributors:* OXQ, 4meter4, Aelffin, Aitias, AndreasWittenstein, Andries, Andyjsmith, Arcadian, Asarelah, Augurar, AvicAWB, Axl, Bazonka, Becritical, Besieged, Bgwhite, Bloodofox, BrainyBroad, Calebfoote, Cimon Avaro, ClanCularius, Colonies Chris, Damian Yerrick, Daveyb007, Dogberdt, DreamGuy, Dukemeiser, Dunro, Ewilson, Firien, Fredrik, Fullstop, GL, Gaius Cornelius, Gene Poole, Griffinofwales, Hans Frörum, Hongooi, Hugo Dufort, Hypehuman, Hyperdeath, Inkling, J04n, JEH, Japo, Jfdwolff, Joelmills, John, Josh Parris, Jwy, Kaldari, Kristenq, Krylonblue83, Kubigula, Kummi, Lgfd, M1ss1ontomars2k4, Magioladitis, Malcolm.lemay, Mazarin07, Mets501, Musician42536, Natalie West, Olivier, Orangemarlin, Owen, Oxymoron83, PaulWay, Pcirus2, Pekinensis, Peppergrower, Petersam, Pinof, Pontificalibus, Prashanthns, Quintopia, RO BlueMonday, RedRabbit1983, Redgolpe, Reidscones, Rgoodermote, Rklawton, Rshefton, Russell E, SCEhardt, Scriberius, Seantm21182, Seaphoto, Seb az86556, ShihoMiyano, SlackerMom, Snagglepuss, Sobreira, Solemnavalanche, Stone, StuartDD, SuzannelAM, Svonkie, Tassedethe, Technopilgrim, Tkaczma, Truthkeeper88, Una Smith, Univer, UseTheCommandLine, Vidkun, Wetman, Wik, Woohookitty, WriterHound, Z.E.R.O., Zoicon5, ²¹², 131, הַיְהוּדִים בְּנֵי לֵאָה־, anonymous edits

Image Sources, Licenses and Contributors

File:Barger.TIF *Source:* <http://en.wikipedia.org/w/index.php?title=File:Barger.TIF> *License:* Public Domain *Contributors:* G Barger

File:Claviceps purpurea.JPG *Source:* http://en.wikipedia.org/w/index.php?title=File:Claviceps_purpurea.JPG *License:* Public Domain *Contributors:* Dominique Jacquin

File:Convulsivus005.tif *Source:* <http://en.wikipedia.org/w/index.php?title=File:Convulsivus005.tif> *License:* Public Domain *Contributors:* T.O. Heusinger

File:Mathis Gothart Grünewald 018.jpg *Source:* http://en.wikipedia.org/w/index.php?title=File:Mathis_Gothart_Grünewald_018.jpg *License:* Public Domain *Contributors:* Auntof6, Edelseider, Mylius, Olivier2

File:Hordeum vulgare Claviceps purpurea 23-7-2009.JPG *Source:* http://en.wikipedia.org/w/index.php?title=File:Hordeum_vulgare_Claviceps_purpurea_23-7-2009.JPG *License:* Creative Commons Attribution-Sharealike 3.0,2.5,2.0,1.0 *Contributors:* Dominique Jacquin

License

Creative Commons Attribution-Share Alike 3.0 Unported
 //creativecommons.org/licenses/by-sa/3.0/