

Organophosphate Poisoning

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Poison in the Home

Six cases of organophosphate (OP) poisoning have come my way since August. During the very hot spell many people were spraying their pets and furniture against fleas. Most of them used one or other brand of organophosphate spray or powder, usually unlabelled beyond the trade name.

Ros phoned me to say Trish was ill. She was unable to move from a pain in her back and right leg. The doctor had been sent for and after a brief examination told her the pain was due to her damaged disc. Trish very well knew this pain was different. Moreover, she had a splitting head, white furred tongue with metallic taste and flashes of heat that felt like fever although her temperature was normal. She was desperately tired and wanted to sleep all the time. The back pain and heat convinced her she had a kidney infection. I gave her a homoeopathic remedy for the symptoms she described.

Two days later she phoned and said "I've cracked it!". She now had chest pains so tight she could hardly breathe. Ros too had chest pains and a streaming nose. But these pains, they realised, putting two and two together, were not due to a worsening of Ros' angina symptoms. Trish remembered that not long before I had been expostulating on how many sheep farmers were suffering OP poisoning from the sheep-dip they use to protect their sheep against the life-threatening diseases scab (scabies) and fly strike maggots.

The day before she fell ill she had sponged her dogs and cat with an organophosphate insecticide and then gone inside to spray her carpets and covers, all on a hot still day when the OP would have been more volatile than usual.

OPs were first used as nerve gas poisons before being turned against insects. In their acute effects they are anticholinesterases that block the cholinesterase enzyme from breaking down acetylcholine at neural connections between nerve and muscle, and between synapses in the autonomic nervous system and in the brain. An excess of acetylcholine in the synaptic cleft produces a maintained depolarisation of the cell membrane, with pain due to over-contraction among the first symptoms.

In homoeopathy an infinitesimally small dose of a poison will cure the condition brought about by a toxic dose of something with the same or similar symptoms. The scientific explanation is that it reactivates the same biochemical pathway.

The calabar bean plant *Physostigma* contains the anticholinesterase constituent physostigmine. Trish, Ros, Trish's little boy and her 5 pets all received *Physostigma* 200c, every 3 hours for 4 doses for the two victims and one dose each for everyone else. I said they should report their experience as a 'Suspected Adverse Reaction' (SAR) to their G.P. and the vet. The vet could prescribe an alternative to the flea problem, 'Program' (lufenuron) taken by mouth. It did not kill fleas but stopped them breeding. There were no known side-effects and my cat had been free of them all summer.

Trish was still dizzy and sweating when she went next day to the vet. The vet was horrified and filled in the yellow SAR form for the Vet. Medicines Directorate. He now stocks a pyrethroid flea spray. The day after, Trish and Ros were 'back on form'. Meantime I had learned Ainsworth's supplied a homoeopathic *Sheep Dip Nosode*. This would be more effective than *Physostigma* because organophosphates attack other enzymes in addition to cholinesterase. Trish's household all took a dose of *Sheep Dip Nosode* 30c.

Sensitisation: The Allergic Response

When organophosphates block cholinesterase the condition is reversible because in a short time the body makes more of the enzyme. But there are two problems with a large or cumulative doses (i) several other enzymes can also be interfered with (see 5) (ii) a person can become sensitised and unable to cope with any more encounters. Some farmers even though they have stopped using OPs are unable to go within a few yards of dipped sheep without an attack of symptoms. This summer at the Royal Welsh Show a pen of dipped sheep was made to be taken away, because although invisible to everyone else they were inducing OP symptoms in those that were sensitised.

Something similar must have happened to Tim who was complaining to Trish of sore throat, splitting head, pain in his left arm and tightness across his chest. She recognised the symptoms as similar to hers the week before. Once again OPs were incriminated: Tim was visiting a friend who had newly sprayed his pets and furniture just as he walked in. I gave him the same Physostigma course, confident that his good health would allow a quicker recovery than Trish and Ros; but the next day every muscle in his legs, arms, chest and stomach ached. He was dizzy, utterly exhausted and felt his head would explode. He had never experienced anything like it in his life.

I asked him about an incident he had heard from his mother: when he was a baby sitting in his pram a farmer spraying the wheat field next to their garden had misdirected the spray so that the pram and baby Tim were covered in it. No one found out what was in the spray but OPs were coming in then. Later as children they used to play in an empty sheep dip, still smelling of chemicals. I guessed he had been sensitised and that had caused the violent reaction. I gave him *Sheep Dip Nosode* 30c to take every two hours. By evening he could go for a walk. Next morning the symptoms were gone.

Alarmed that 3 people I knew were victims of OP poisoning from flea spray I wrote to the local paper. Tim was interviewed and my telephone number given as a helpline.

I got a call from Margaret, who had been spraying against fleas all summer, and moreover had slept in a room with a Vapona fly strip. She had suffered for weeks from palpitations, chest pain, hallucinations, fatigue, tearfulness and general unwellness. Her GP had run an electrocardiogram (ECG) and taken urine and blood tests. He was mystified. Even had he blood-tested for OP poisoning it would have been too late because although it shows up as a depletion of cholinesterase, the test must be made within about two days of exposure or the body makes more enzyme. This masks all the repercussions the poison had induced in the body's system.

Margaret's symptoms went with a course of *Sheep Dip Nosode*, but returned three times: once on visiting a flea-spraying friend when it was again corrected with the nosode and kept her free till Christmas. At the second relapse, I thought it might have been caused by sprayed food and advised washing or peeling fruit and vegetables. She recovered with the nosode, but to her dismay a month later was back to square one, with return of all the symptoms. She is an art teacher, and now I suspected there was cross-sensitisation with a paint or solvent and advised her to see a specialist in desensitisation, once the nosode had made her feel well enough to come out of the trough she was in, where any extra task was too much.

Food Contamination

Organophosphates are becoming all-pervasive. Water boards are worried by their presence. The creams and ointments which we buy often have a lanolin base. Lanolin is extracted from sheeps' wool and some of the fat-soluble insecticide can be captured on its way to their skin. Mothers should be sure and choose a cream with a vegetable base for sore nipples or their baby's nappy rash. News of spray residues makes people begin to worry about the safety of their food.

Just before Christmas Helen's pain started with an ache in the lower back like a urinary infection, and then moved to the spine. Getting up or sitting down she was in spasm. The driving position was awful. Lying down was the worst. Walking eased it. She had just recovered from flu and at first thought it was a return of flu symptoms for which I was about to give her *Gelsemium* and *Aconite*, until she remembered a few hours before it started she had had some grapes. She had washed them as always but they had a strange bloom and funny feel to their skin. Her goat who eats everything refused to have any. Having myself suffered from a gut pain that developed into pleurisy the year before after eating a few florets of what must have been sprayed cauliflower – because it kept its pristine whiteness after 4 weeks on the compost heap – I realised this was not an after effect of flu. I gave her a course of *Sulphur 6x* as a detoxifying or drainage remedy that seemed to fit the symptoms and had worked for me. It brought on a severe aggravation and made her aching very much worse. The remedy had activated a detoxification system that could not cope. Perhaps the spray was anticholinesterase: either an OP or carbamate. I took over *Physostigma 30c* to take every 4 hours x 4, followed by *Sheep Dip Nosode 30c*. She slept better. Next morning all the pain had gone from the lower half of the body and had moved up. There was discomfort 'like a mass inside her ribcage' and a tight chest. By evening it had eased and she was 'bouncing around' as she fed the ducks.

The grapes remained as pristine as my cauliflower. Helen phoned Environmental Health, and a Trading Standards Officer took away the two week-old grapes for analysis. He said they were fully aware of what was happening and getting case after case. But the Government did not want to know. We have not heard any more.

The Battle to Get SARs Reported

Sheep farmers have found for years it well nigh impossible to get their symptoms reported or their origin accepted. First they themselves do not recognise their flu-like, muscular and tiredness symptoms as caused by the dip. By the time they go to their GP they may have a spectrum of chronic symptoms often different in each individual and that do not fit any known diagnosis. When they have finally established for themselves the cause of their illness, their evidence is dismissed as anecdotal, bereft of any scientific basis, or explained away as psychosomatic by such authorities as MAFF's medical advisers or other pillars of the medical hierarchy.

We ourselves found there were hurdles in getting the acute flea spray reactions reported. Trish's yellow SAR form was sent to the Vet Medical Directorate (VMD), who said that since the furnishings had been sprayed the OP was not a vet product but a pesticide and diverted the form to the Health and Safety Executive (HSE). The HSE said that because it did not happen at work but in the home it was a matter for the Local Authority and sent a leaflet explaining the permutations. Most people would have given up, but Trish and Tim pursued it to the Local Environmental Health where they at last found a sympathetic official who had also read my letter to the *S. W. Wales Guardian*, and took it up. After about three months of all our badgering the VMD sent the relevant forms requesting full medical details for their files.

However, these forms arrived after the House of Commons Agricultural Select Committee had been questioning the VMD and Pesticides Safety Directorate on the way they discharged their responsibilities as both licensing and surveillance authority, particularly with respect to OP products about which there was much public concern. They had found from the numerous witnesses that the SAR surveillance scheme was far from satisfactory and lacking in openness, and recommended that surveillance be taken from the VMD and given to an independent body.

As a result of years of networking between victims, campaigners, committed doctors and

scientists and concerned politicians, the outcry against OP has now reached such a pitch I foresee they will shortly be quietly withdrawn. The multinational companies have all along blocked investigation, fearful of litigation. The Government has been stony faced for two reasons (a) fear of litigation because it was they that made sheep dipping and warble fly treatment of cows mandatory, with no guidance on alternatives to what was known to be a deadly poison (b) a desire to protect commercial interests and secrecy at all costs so that the full toxicology of OPs, their adjuvants, solvents and breakdown products was either unknown or hushed up.

We are left with the ruined lives of those who suffer the chronic and delayed effects of OP poisoning, or who may one day be faced with its delayed effects (1). The more these are investigated, the more they appear contributory to the diseases that worry us most: ME, MS, Alzheimer's, Parkinsonism, depression, heart disease and possibly BSE/CJD.

The Chronic and Delayed Effects of OP Poisoning

When OPs cause acute poisoning they react with the OH group of the Serine amino acid in the cholinesterase protein, producing muscular contractions and sometimes impairment of concentration and memory. But organophosphates can react with many other enzymes, depending on the individual, causing a range of acute and intermediate effects. Some, although reversible, may develop into allergies, cross reacting with antigens by compromising detoxification systems in the liver such as sulphoxidation, and giving rise to food intolerances (2, 3). Others interfere with the neurotransmitter dopamine, causing Parkinsonism; or with GABA (gamma-amino butyric acid), an important inhibitory neurotransmitter whose under functioning can cause cerebral ischaemia and convulsions in the acute case, and severe anxiety in the chronic. Worst of all they can interfere with serotonin (5HT) (4).

Serotonin in the blood stream is a humoral agent inducing vasoconstriction. In the hypothalamus it acts as a neurotransmitter controlling heat rise (recall Trish's dizziness and flashes of heat). Low serotonin levels in the brain are a major cause of depression, and when combined with stress and anxiety, such a depression may lead to suicide.

Two population studies (5, 6) found that farmers are the social group with the highest mortality from suicide. A map of its incidence among males shows clusters in the hills and uplands of Britain, the very areas where sheep dipping is a part of farming life. Another cluster is in Lincolnshire where arable crop spraying accounts for many cases of OP poisoning. OP effects on neurotransmitters demand great circumspection by the medical profession. Dr Robert Davies, Consultant Psychiatrist, warns against giving antidepressants to those who have had OP exposure, where desensitisation of acetylcholine receptors may lead to "hellish problems". (4) Anaesthetists, hospital staff and vets should similarly be aware that if the anaesthetic contains suxamethonium, a muscle relaxant, it potentiates the action of OPs and could prove lethal to anyone or to an animal that has been over exposed.

OPs can also cause 'delayed effects', held to be irreversible. These may take the form of neuropathy, either in the central nervous system (CNS) or in the peripheral nervous system; or it may give rise to myopathy (muscle damage) with or without neural involvement. Mark Purdey's hypothesis on OP poisoning as a route to BSE in cows and CJD in humans proposes that these encephalopathies are caused or contributed to by certain OPs that penetrate the CNS and phosphorylate the normal PrP protein in the brain inducing a change in the molecular conformation (7, 8). It is this change in enzyme shape that is thought to turn the protease into the infective prion, which is then no longer degradable and persists in a degenerative attack on brain tissue (9).

In the peripheries there may be a myopathy resembling ME (myalgic encephalitis), where interference with mitochondrial function (10) now explains the utter exhaustion of ME

suffers who are unable to synthesise sufficient ATP for the body's energy needs. There may be a neuropathy usually with lower limb paralysis (11) or a neuropathy identifiable as MS (multiple sclerosis), where attack on myelin nerve sheaths again leads to paralysis, this time accompanied by cramping pains. MS is beginning to appear among farmers, and Professor Behan I understand has 4 out of 10 OP patients who contracted it.

I stumbled on my sixth case when in conversation with a client I made a passing reference to OPs. In a flash she realised that OP poisoning was the reason why her relative X was in a wheelchair. Later X phoned me up. Ten years ago at 28 years of age, a fit man, he had been working on a big arable farm in Lincolnshire as a tractor driver spraying crops. The farmer would use 6 or 7 chemicals in a cocktail. There were no carbon filters in the cab in those days, or rules about water being available for washing. The air conditioner blew the spray back into the cab. He had a tooth abscess followed by flu, then suddenly lost the use of his arms and legs. The power in his arms returned but for the last 6 years he has been in a wheelchair. He gets very tired and is prone to infections. His condition was given all sorts of names, such as 'hysterical paralysis', and finally decided to be viral. Early on he had asked if it could have been caused by chemicals. and told "oh, no".

He himself believed it was ME but the Cardiff research unit on ME could not confirm it. He has no disability pension for want of proof of what is wrong, and feels in limbo, bereft of the recognition a diagnosis would have brought. I told him he was not alone. There were thousands of fellow sufferers, and if he joined the OP group in Green Network (2) he would find them and be able to help himself. He should eat organically grown foods (which he does) and contact Dr Sarah Myhill who specialises in desensitisation, and would know who to refer him to, for his condition to be diagnosed.

Coping and Preventing

Organophosphate insecticides replaced the organo-chlorines which accumulate in body fat because it was believed OPs were rapidly detoxified. Probably in most cases the metabolism's efficient detoxification systems will degrade everything safely. But our environment is becoming burdened with pollutants and our diets in many cases do not give us the minerals and vitamins we need to run the cellular pumps and liver and kidney detoxifying mechanisms. Moreover OPs attack where there has been a depressed immune system (Helen, X) or some specific vulnerable point (Trish, Ros, Tim).

Homoeopathic *Physostigma* or *Sheep Dip Nosode* can resolve an acute poisoning, but in my experience *Sheep Dip Nosode* may aggravate a 'delayed' condition. In these cases mineral and vitamin supplements are required to strengthen metabolism and tissue functions, particularly selenium, magnesium, zinc, the B vitamins and E and C.

Mercury removal from teeth fillings may be important to prevent a drain on selenium. An organic food diet and avoidance of drugs is essential, because the liver cannot cope with any more overload. For the rest of us we can help protect ourselves from a toxic environment by similar measures, and above all by demanding a benign system of agriculture and an economy and infrastructure that does not depend on pouring pollutants into the atmosphere, rivers and seas.

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