COT DEATH THEORY WORTHY OF AIRING

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THIS distressing topic has been much in the news recently. While much research has been carried out and much useful data gathered the cause for many cot deaths has defied solution. Cot deaths in New Zealand are among the highest in the world and any rational idea is worth exploring.

What follows is only a hypothesis from one who tends to look at problems from a "chemical" point of view. I do not have any experimental or observational data to support the theory and it is put forward in the hope that it may stimulate discussion along lines which perhaps have not been considered before.

It is based on the following ideas: Many cot death (CD) babies die because they stop breathing. They are not smothered.

For some reason there is a failure of that part of the nervous system which triggers breathing.

Most CD babies are in the one to four month age group. Small babies are more prone to CD than large "bouncing" babies and babies are more susceptible in the winter months and in colder climates.

It seems that the incidence is greater in recent years. If CD is more common now why should this be? What changes have occurred? If any, how could they affect infants?

It seems to me that the deaths could be caused by infants being exposed to a very poisonous gas, one which does not have a very strong smell, has the effect of stopping breathing and which the infants were not so likely to come in contact within earlier days. One type of gas comes to mind, hydrogen cyanide or related cyanides (I can just imagine the raised eyebrows)

There has been a fundamental change in the washing materials. (soaps, detergents etc.) used for washing infants clothes, bedding and so on.

Relatively few years ago all such washing was done with conventional soaps. There was no nitrogen present other than that from urine and a small amount from faeces.

Virtually all this nitrogen was in the form of urea, ammonia and small amounts of amino acids, all of which are readily removed from fabrics by washing with soap.

Today it is quite different. Almost everyone uses synthetic detergents and these formulations frequently contain organically bound nitrogen. Many use the so-called "fabric softeners" and treat nappies with disinfectants rather than washing them. Both of these compounds also contain nitrogen in the form of quaternary ammonium compounds (QAC).

Residues of the QAC can remain in the fabric both as the simple compound and in combination. If soap or detergent are not removed from fabric during rinsing (and they are not easy to rinse out) the application of the QAC will cause an insoluble compound to precipitate on to the fabric.

This compound containing organically bound nitrogen will not wash out readily and will build up in the fabric. Thus babies can now be virtually surrounded in fabric containing organic nitrogen in a form which never existed in earlier days.

It is suggested that such compounds can be degraded to simple cyanides by micro-organisms or possibly by the action of water or urine.

Cyanides are readily absorbed through the skin and are extremely poisonous. The lethal dose is very small indeed, and the effect is to inhibit breathing thus causing suffocation.

As stated. above CD babies die because they simply stop breathing. There is a remarkable parallel.

At these very low levels the detection of cyanide by chemical means would be very difficult indeed. The cyanides are volatile and relatively unstable. It is true that they have some smell but it is not unpleasant. In any event, if a child were found dead the bedding and clothing would be disturbed immediately and the gas would dissipate quickly, unnoticed by the frantic parents.

Small thin babies would be more susceptible because their skin surface area is correspondingly greater relative to their weight. They would be more likely to receive a higher dose than would larger babies. Also there could tend to be a greater build-up of nitrogen-containing residues in fabric in colder, wetter climates.

Why do cot deaths occur mainly in the one to four month period after birth? Again one can only hypothesise but it is known that during this period there are changes in the blood supply.

There are various substances which will combine or complex with cyanide and render it harmless, one example being iron in solution.

Could it be that the mother provides some chemical which guards against cyanide with is lost soon after birth and not built up again until the child is a few months older?

I suggest that the above effect of cyanide generation may be tributing to cot deaths. If so, compounds containing nitrogen should not be used in washing or treating clothing, bedding etc for small babies. People should be encouraged tu use only soap for washing and to avoid fabric softeners and sanitisers.

It is not suggested that QAC. compounds should be discontinued for general purposes. They are very useful compounds and are harmless for other applications. On the other hand I do consider that the above proposition should be studied. possibly with a view to having a trial period during which the use of QAC compounds is avoided for washing bedding, clothing, nappies etc for babies up to say six months.

As stated at the outset it is only a theory but there may well be something in it. The economic harm to the manufacturers of QAC compounds and detergents should not outweigh any possiblity of saving lives.

It is perhaps the sort of trial that could be carried out in a particular community, for example Auckland city or province with a campaign of advertising and also instruction to all mothers of babies born in the region. Think what it would mean if the incidence of cot deaths could be reduced.

For the technically minded soaps and the syndets used for laundry purposes are anionic surfactants frequently containing long chain amides. Fabric softeners are cationic compounds of the quaternary ammonium family. When anionic and cationic syndets are mixed they precipitate es the insoluble "salt." These compounds, like the QAC's, contain carbon-nitrogen bonds. The cyanide could be in the form of hydrogen cyanide (HCN) or cyanogen (C^2 N^2) or possibly alkyl cyanide.

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