

Cold Chain and Insulin: Should We Follow the Polio Vaccine Example?

Sir,

One of the problems with insulin storage is its temperature sensitivity. Exposure to high temperatures can result to loss of potency of insulin. Storage of insulin at 32--37°C reduces the potency of insulin by 14--18%.^[1] To overcome this, several methods to storing of insulin in the neighbour's fridge to storing it in an earthen pot are used by our patients.^[2,3] Since these are unapproved frugal innovations, it is difficult to know the effectiveness of these "jugaad" methods. Even in insulin bought from pharmacies in remote villages, we have no way to know the integrity of the cold chain of insulin at the point of sale. This lack of attention to environmental temperature is not a major issue in Europe or parts of USA where the ambient temperature might be closer to 25°C. However, in a hot country like India, the ambient temperature can become crucial.

I propose that to tackle this problem, insulin manufacturers should be persuaded to use the same low cost technology used in polio vaccines in India. The vaccine vial monitor (VVM) is a thermochromic label put on vaccine vials,^[4] which gives a convenient way to detect deficiencies in cold chain. It consists of a square within a circle. If the square becomes the same color or darker than the circle, the color change indicates that the vaccine has been exposed to higher than recommended temperature, putting the vaccine potency in jeopardy. This is cost effective enough to be executed in scale as has been shown by the polio vaccination in India. The WHO has said that the VVM is crucial to polio eradication programme.

The challenge is to produce an IVM---an insulin vial monitor, which will change color if a particular threshold is reached. From published information, 4--8°C is a reasonable threshold for assessing the integrity of the cold chain.^[5] Since the number of insulin users is huge, the economics of scale would offset the additional costs associated with the use of IVM and in hot countries, the fractional additional cost, would be well worth for the peace of mind and confidence the IVM can provide not only to the doctor but also to the patient, that the insulin they get is of full potency.

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Conflicts of interest

There are no conflicts of interest.

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