

Bottoms-up or thigh high? Preferred sites for intramuscular injections

Professor Shima Gyoh challenges current wisdom... with some very cogent thinking!



Intramuscular injections are preferred over the oral route when there is a need to be sure of sustaining a reasonable level of a drug in serum over a reasonable period of time. It would seem that this can be better achieved by intravenous infusion, but the consequent dilution of the drug in the carrying fluid outside the body does tend to have an adverse effect on efficacy, so bolus injections into intravenous infusions are often preferred. This, however, does not provide uniform serum levels, but spike levels which then drop between injections. Intramuscular injections provide a more uniform sustenance of serum levels as the drug is absorbed from the muscle depot after the first injection.

The commonest sites for intramuscular injections are the gluteal (buttock), deltoid (shoulder) and quadriceps (thigh) muscles. The deltoid site is popular for vaccinations; other injections are usually given into the gluteal muscle. The quadriceps is the least commonly used world-wide, yet it also the best site.

The muscles themselves do not seem to have any intrinsic property to qualify them for any specific injection. The deltoid is conveniently accessible and is favoured for inoculations. It plays only a minor part in locomotion, and therefore absorption rates are slower, but the speed of absorption is not critical in vaccinations. It is not suitable for injecting volumes beyond 1 millilitre. Fortunately, vaccine injections are hardly more than a half a millilitre. The skin over the deltoid muscle is also commonly used for intradermal injection.

Injections of higher volumes, around 10 millilitres, are popularly given in the gluteal muscle. To avoid the sciatic nerve, every clinician is advised to aim for the

upper, outer quadrant of the area. Accidental injection into the sciatic nerve causes flaccid paralysis of the leg. If, however, the original fever for which the injection was given happened to be acute poliomyelitis which subsequently caused the paralysis, the clinician who gave the injection could be accused of causing it. This was the disadvantage of gluteal injections when polio was common, and it may still be the case in countries like Nigeria, Pakistan, and Afghanistan where it has not yet been eradicated.

The other big disadvantage of gluteal injections as far as patients are concerned is the fact that they have to drop their underpants and cannot see what the clinician is doing behind them. I do not like anyone going behind me with a sharp instrument! The quadriceps site does not have these problems. There is no large locomotor nerve to damage. It is altogether a more civilised site to give intramuscular injections.

Both the gluteal and the quadriceps are muscles of locomotion, so absorption in ambulant patients is equally good at either site, but the quadriceps has an edge over the gluteal. The gluteal region is more likely to be covered in considerable fat, so the needle is more likely to deposit the drug in adipose tissue and produce a tender lump that disappears more slowly, compromising sitting and lying on the back, activities very common with patients. If the lump develops into an injection abscess, so much the worse for the patient.

The dice is indeed heavily loaded against gluteal injections, but the site is so established in medical culture that the majority of doctors and nurses do not for a moment consider using any other site for first choice, and patients become apprehensive when the thigh is preferred. I have to often coax patients before they agree to the quadriceps site. Perhaps the time has come for the medical profession to seriously consider changing this culture.

Prof Shima Gyoh has held many posts ranging from village doctor to DG of Nigeria's Federal Ministry of Health and Chair of the Medical and Dental Council of Nigeria.