CONSIDERING THE CURRENT EVIDENCE FOR IMI SITE SELECTION IN MENTAL HEALTH NURSING PRACTICE

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Abstract

Aim: This paper discusses the emerging literature on intramuscular injection (IMI) site selection to guide Mental Health Nurses through best practice techniques with the current evidence available.

The discussion focuses on the mental health setting where there are additional considerations that need to be discussed when applying best practice principles, such as needle length, injection technique, privacy and comfort of client, and managing the therapeutic relationship.

The author argues that there has been an imbalance in the way the latest evidence has been interpreted or applied in the clinical context. Many authors advocate the ventrogluteal (VG) IMI site as being the preferred site over other IMI sites. In particular, concerns have been raised about the historically preferred and traditionally used dorsogluteal site (DG). This discussion seeks to highlight disparities in the current literature around IMI site selection, and calls for a more balanced interpretation of this evidence in the mental health context.

Decisions regarding the preferred site to use for IMIs should be based on the clinical judgement of the Mental Health Nurse (MHN). Site selection should not be based purely on anatomical theory, and one site should not be universally advocated as the preferred site over another site. Consideration needs to be given to the client’s body make-up and Body Mass Index (BMI), needle length, degree of invasiveness and therapeutic engagement.

Key words: Dorsogluteal, evidence, ventrogluteal, intramuscular injections, Mental Health Nursing

Introduction

Administering IMIs is an important part of Mental Health Nursing practice (Walsh & Brophy, 2010). There are four main IMI sites, the VG and DG sites already mentioned, and the Vastus Lateralis and Deltoid sites (Cocoman & Murray, 2008). The DG site has traditionally been the most used site for IMIs (Cocoman & Murray, 2008).

However, there has been increasing discussion in the literature about the risks associated with IMIs in the DG site (Greenway, 2004; Cocoman & Murray, 2010; Walsh & Brophy, 2011). These include such things as its proximity to major nerves and blood vessels, thick adipose tissue leading to slow uptake of medication, and the randomness of site location. As a result, many authors have supported the use of the ventrogluteal site as the preferred site for IMIs (Cocoman & Murray, 2010; Walsh & Brophy, 2010). In fact, some authors maintain that there is wide agreement in the literature as to the merits of using the VG site as the preferred site (Small, 2004).

Significantly, a number of leading Australian universities have not only begun to advocate for the VG site, but are not teaching students the technique of administering IMI to all site locations (Costello & Wolf, 2011). This is despite there being inconsistencies in the available data when comparing the different IMI sites in terms of adverse events and/or efficacy of medication administered.

Practice guidelines are also divided in their recommendation of the preferred site for IMIs. In Australia, Wynaden, Landsborough, McGowan, Baigmohamad, Finn & Pennebaker (2006) recommended that Mental Health Nurses use the DG. On the other hand in the United Kingdom (UK) Gray, Spilling, Burgess & Newey (2009) outlined the VG site as the preferred site for long acting IMIs. This discussion will focus on the debate about the use of the DG and VG IMI sites because of the specific recommendations being made about these two sites.

The basis for this ‘new’ evidence leading to recommended changes in practice is largely theoretical and has not been empirically tested. There are other authors who share these concerns and have questioned the shift to recommending one site over others (Costello, Moxham & Broadbent, 2011).

In considering this emerging change in practice and conflicting evidence within the literature, the authors suggest that a more balanced interpretation of the current evidence is required. It is important that all Mental Health Nurses are able to consider and be proficient in all available IMI sites (Wynaden, Landborough & Chapman, 2005). Furthermore, nurses need to be able to call on a range of information and perform individual assessments, considering all the variables when determining the best site to use for each patient. Factors such as weight and Body Mass Index number (BMI), amount of adipose tissue, needle length, perceived invasiveness, privacy and overall comfort of the client are all considerations.

The aim of this discussion is to assist nurses to interpret the current available evidence regarding IMI site selection. Furthermore, the authors’ aim is to promote autonomous clinical decision-making that is responsive to a number of different clinical scenarios.

Discussion

The Dorsogluteal Site

Historically the DG site has been most used within in mental health setting for IMI (Wynaden et al., 2005). Despite there being a number of different techniques used in the site location, the upper outer quadrant has traditionally been the approach to locate the target muscle. Due in part to this broad or perhaps vague location technique that relies too heavily on visual identification, rather than palpation, there have been discrepancies as to the specific target muscle (Cocoman & Murray, 2008). Specifically, confusion lies between the Gluteus medius and the Gluteus maximus, as to which is the target muscle (Cocoman & Murray, 2008). Small (2004) maintains that this visual approximation can lead to an injection
being placed too low and that in fact the correct location is the upper outer quadrant of the upper outer quadrant.

The presence of major nerves and blood vessels, including the proximity to the sciatic nerve and superior gluteal artery has further fuelled this concern. Sciatic nerve damage has been reported, as has the risk of relatively slow medication uptake as a result of thick layers of adipose tissue that commonly exist in this region of the body (Cocoman & Murray, 2008; Gray et al., 2009; Ramtahal, Ramlakhan & Singh, 2006; Small, 2004). In fact Nisbet (2006) maintains that many IMI injections into buttocks are not IMI but subcutaneous injections. This can then potentially expose the client to an increased risk of fat necrosis and calcification (Covington & Trattler, 1997; Prosch, Mirzaei, Oschatz, Strasser, Huber & Mostbeck, 2005). Injections into fat can also lead to local infection and irritation (Cocoman & Murray, 2008). These are all valid concerns but the evidence at this stage does not preclude the DG site being used if indicated, based on careful assessment of adipose tissue thickness, appropriate needle length and overall willingness of clients to receive the IMI.

Another consideration in this discussion is that of needle length. Many authors have pointed out that the distance to reaching muscle is greater than standard needle length. One study measured fat thickness at the DG site in a sample of clients. It ranged in thickness from 1.7cm to 5.7cm with the needle length used in this setting being between 3.5 and 3.8cm. Therefore a number of these clients were receiving subcutaneous injections (Haramat, Lorans, Lutwin & Kayela, 1994). Similarly, a study of attempted IMI injections in the DG site found that only 32% reached the muscle, with the rate being as low as 8% in women (Chan, Colville, Persaud, Buckley, Hamilton & Torreggiani, 2006). Obesity is a significant factor in whether IMI injections reach muscle tissue (Zaybak, Ulku, Tamsel, Khordshid & Eyre, 2007). As a result needle length selection needs to be closely linked to a careful assessment of the patient’s size and body type, making education for nurses around BMI assessment and needle size selection more critical (Wynaden et al., 2006). Cocoman & Murray (2008) have gone as far as saying needles longer than 50mm need to be used, particularly in females. Being able to use shorter 21- and 23-gauge needles that will reach muscle tissues is another distinct advantage of the VG site (Cocoman & Murray, 2008). The manufacturer of Risperdal Consta supply 50mm needles; this sized needle is associated with more reported discomfort (Wynaden et al., 2006). Gray et al., (2009) note that Risperdal Consta is licensed in the UK for use only in the DG site.

The Ventrogluteal Site

As pointed out earlier, the VG site has been promoted in the literature as being the preferred site for IMI (Cocoman & Murray, 2010; Gray et al., 2009; Small, 2004; Walsh & Brophy, 2010). A number of reasons have been provided in support of this argument. One of the major advantages of this site is the presence of thick gluteal muscle and the relatively thin layer of fatty tissue. This in itself makes it easier to ensure true IMI injections, and to prevent inadvertent subcutaneous injections. It is also free from major nerves and blood vessels but possesses multiple small nerves and blood vessels to facilitate absorption of active medication. (Cocoman & Murray, 2008; Cocoman & Murray, 2010; Greenway, 2004).

The VG is thought to have more pronounced bony landmarks that make it easier to palpate, therefore making the site easier to locate, even though the technical difficulty of locating the two sites has not been studied (Cocoman & Murray, 2008). Despite this, the literature has descriptions that are complicated, conflicting and/or ambiguous. There is also a distinct lack of knowledge in using this site, and some authors highlight misinformation in the procedure (Cocoman & Murray, 2008; Costello & Wolf, 2011).

In a survey of 94 nurses, respondents said that the VG site was not used and was in fact regarded as unsafe due to the difficulty in locating the site. They had not experienced adverse events with the DG site. Incorrect identification of DG caused sciatic nerve damage (Small, 2004). In one study as few as 12% were familiar with and confident in using the VG site (Rodger & King, 2000). Therefore the lack of reported complications associated with the VG site may be explained by the relatively low usage (Wynaden et al., 2006).

In a study of depot injection administration among 96 consumers, 71.9% received DG injections. All injections were given by a nurse trained in best practice technique; 62.5% of the consumers were considered to be obese and yet 38mm needles were given to 11 consumers and 32mm needles were used with nine consumers. The nurse did not assess BMI and many injections may not have reached target muscle tissue (Wynaden et al., 2006).

This is a cause for concern, but not in itself an argument for the exclusive use of the VG site. According to Walsh & Brophy (2011) the VG site has similar issues with the thickness of subcutaneous tissue. It merely illustrates that all nurses need to be trained in issues associated with IMI injections for obese consumers. Nurses should also be trained in the use of all IMI site locations (Cocoman & Murray, 2010; Costello et al., 2011; Wynaden et al., 2006). A position which Wynaden et al., (2005) advocated for and recommended was that all four sites should be under consideration when administering an IMI injection.

Despite this, in best practice guidelines regarding the mental health setting published by Wynaden et al., (2006), it was suggested that the DG site was the preferred site. On one hand the literature is suggesting the VG site has universal acceptance, on the other the DG site is being recommended. In the space of six years, three different positions on site selection have been provided (Cocoman & Murray, 2010; Wynaden et al., 2006; Wynaden et al., 2005). Some authors have been critical of the lack of willingness to implement evidence within practice, and in this case to use the VG site over the DG site (Cocoman & Murray, 2010). One might suggest that this is well placed scepticism as this paper has argued. It is not considered best practice to advocate for one method over another, when the supporting evidence consists of anecdotal information and anatomical theory. Cocoman & Murray (2008) recognise that the available evidence in support of using the VG site to date is ‘contradictory’ if not ‘non-existent’. The profession is therefore left with conflicting information and the evidence for site selection is not definitive.

Despite the concerns about the risk of adverse events associated with the DG site, the reported complications are limited and can be explained in some cases by incorrect identification (Small, 2004). With attention to the proper technique, and careful palpation of anatomical landmarks, the risk of adverse events or injury is minimised (Ramatahal et al., 2006). One report does discuss a complication with the VG site (Muller-Vahl, 1985).

Other Considerations

There are other factors besides site selection that need to be considered in the practice of IMI administration. The overall comfort experienced by the client receiving the IMI is directly
linked to the technique employed by the nurse (Gray et al., 2009; Workman, 1999). The Z-Track method is necessary to reduce discomfort, reduce complications and reduce the potential for leakage (Cocoman & Murray, 2010; Gray et al., 2009; Workman, 1999).

After completing an assessment of which site to administer the intramuscular injection, the clinician makes an informed decision on which is the most appropriately gauged needle to use (Gray et al., 2009). Workman (1999) suggests that the chosen needle should be long enough to reach to the target muscle and still have a quarter of the needle visible to the clinician. The composition of the medication, such as the high viscosity in oil-based depot, is a consideration to be taken into account by the clinician. The medication composition will assist the clinician’s decision on injection site and needle gauge (Workman, 1999; Cocoman & Murray, 2010). The speed of the injection and the volume of medication all influence patient comfort (Workman, 1999; Zimmermann, 2010).

Communicating in a respectful and courteous manner can assist in making the IMI a more pleasant experience for the client and the clinician (Workmann, 1999). This is particularly critical in a mental health setting where the degree of engagement or willingness of the client to receive the injection can vary (Gray et al., 2009). Therapeutic rapport and trust can be influenced by the degree of comfort experienced by the client (Workman, 1999). Taking into consideration the client’s dignity and particular privacy needs are paramount.

Therefore, site selection needs to be made in consultation with the patient with the view to maintaining trust and rapport. This needs to be done while still mindful of the potential adverse events, and the possible implications for medication efficacy. The VG site may be considered as more invasive because it requires more undressing and more need for palpation and skin contact to locate the site.

**Conclusion**

The evidence to support the use of the VG site over other sites is largely theoretical and based on anatomical considerations, rather than empirically-tested procedures (Cocoman & Murray, 2010). There are conflicting discussions within the current literature about the VG and DG sites in terms of medication efficacy, in particular depot medications and adverse events. Some of the concerns related to adverse events associated with the DG can be addressed through injection technique rather than site selection alone. These include needle length, BMI and body weight assessment, and careful application of Z-track method and attention to the speed of injection (Workman, 1999; Zimmermann, 2010). These factors as well as the degree of invasiveness and overall therapeutic engagement between the nurse and the client also need to be considered.

It is puzzling to find a number of conflicting recommendations within the literature on IMI site selection (Cocoman & Murray, 2010; Costello et al., 2006; Gray et al., 2009; Walsh & Brophy, 2010; Wynaden et al., 2006; Wynaden et al., 2005). It is also concerning that the education of future nurses is being influenced by inconclusive evidence which has been portrayed as definitive (Greenway, 2004; Cocoman & Murray, 2010; Walsh & Brophy, 2010). The trend towards teaching undergraduate nursing students the technique of administering IMIs utilising the VG site and not the DG site seems misplaced.

It suggests returning to a past era of nurse education where nurses were taught what to think, not how to think. It makes sense that the VG site has a number of clear advantages over the DG site. However, the lack of empirical evidence on IMI site selection needs to be more formally recognised. Therefore the profession would be better off advocating for an approach to IMIs that supports autonomous clinical decision-making, rather than a one size fits all approach.

**Recommendations**

All nurses need to be trained in administering IMIs to all sites. Mental Health Nurses need to consider many additional factors when making decisions about the best site to administer an IMI for each individual client.

These include:

- ensuring the Z-track method is used to reduce discomfort, complications and potential for leakage;
- needle size including gauge and length;
- composition of medication including viscosity;
- speed and volume of injection;
- ensuring respectful and courteous communication style;
- degree of engagement and willingness to receive injection;
- client’s dignity and privacy;
- degree of invasiveness and need for undressing and skin palpation.

More studies are required to confirm the potential risks associated with IMIs administered in the DG site. These include further investigations of IMIs administered subcutaneously and the detrimental effect this may have on medication efficacy.

**References**


NSW Health Nursing and Midwifery Office and HNELHD Nursing and Midwifery Service are implementing the Essentials of Care program (EOC) across HNELHD facilities.

The program focuses on the patients’ experience, as well as what the patients’, their families and health professionals value about effective and relevant patient care, care that recognises all that’s essential for achieving the best outcomes.

EOC’s major focus is in the development of clinical environments that empower patients, their families and health professionals to work towards this together and to challenge the issues that compromise this.

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