

## Incidence and Aetiology of Intramuscular Injection Abscess

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### ABSTRACT

**Aim:** To find out the incidence and etiology of intramuscular injection abscess either in deltoid or gluteal region and secondly to disseminate the awareness regarding intramuscular injection technique.

**Methods:** All the patients included in this study who presented in surgical department at Avicenna Hospital in the period of 1<sup>st</sup> Jan 2013 to 30<sup>th</sup> June 2014, with intramuscular injection abscess either gluteal or deltoid regions and were treated by Incision and drainage under general or local anesthesia.

**Results:** A total 64 patients were admitted in surgical department with H/O intramuscular injection who had planned incision and drainage of abscess. Eighteen (28.120 %) patients range from 1-10 years. Four (6.25%) patients were from 11-20 years. Thirteen (20.31%) patients were 21-30 years. Twelve (18.75%) patients were 31-40 years. Eight (12.50%) patients were 41-50 years. Seven (10.93%) patients were 51-60 years. Two (3.12%) patients were above 60 years of age. All age group patients were suffering from injection abscess. All these patients had received injections from some local practitioners. The cause may be wrong techniques or the use of vials with multiple pricks and unsterile syringes. All cases had unilateral abscess. Thirty eight (59.38%) patients were having intragluteal abscess out of which twenty were female and eighteen were male. Twenty six patients (40.62%) had abscess on arms. Improper intramuscular injection techniques and various subcutaneous thicknesses. According to sex and body weight are the main contributing factors in subcutaneous rather than intramuscular injection which lead to abscess formation after intragluteal and deltoid injection.

**Keywords:** injection abscess, gluteal region, deltoid region, local practitioner.

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### INTRODUCTION

The administration of injection is one of the skills that nurses use regularly in clinical practice. The objective of an intramuscular injection (IM) is to deliver the drug into the muscle layers beneath the subcutaneous tissue. It provides rapid systemic action and absorption of the drug in relatively large doses (up to 5ml in most sites)<sup>1</sup>.

The dorsogluteal site or the 'upper outer quadrant' is the intramuscular injection site of choice. However, when this site is used there is a significant risk that the drug will not reach the muscle, but will be injected into the subcutaneous tissue layer, causing irritation and negatively affecting uptake of drug. It is also associated with pain, muscle contraction, tissue necrosis, gangrene or fibrosis<sup>1</sup>.

Infection can be a potential complication of any injection, due to the very nature of traversing the protective barrier of the skin when injecting. The mechanism by which infection is established probably relates to tissue trauma, direct or due to drugs, tissue ischemia, and Inoculation of bacteria. Similarly the cause of injection abscess at arm is due to wrong site in arm instead of deltoid muscle. As a result of repeated injections into a single site, skin and

surrounding tissue are damaged, develop local ischemia and necrosis, and become susceptible to infection<sup>2,3</sup>.

In developing countries, abscesses are more frequently secondary to injection involving unsterile techniques including the use of contaminated needles and dirty clothes. Major risk factors for superficial abscesses include malnutrition, obesity and metabolic diseases such as diabetes, uremia and jaundice. Disseminated malignancy may also be included, together with immune-suppression caused by radiotherapy, chemo-therapy or AIDS<sup>4</sup>. Once an abscess is detected, incision and drainage should be performed and may need to be repeated<sup>5</sup>.

### PATIENTS AND METHODS

In the period between 1<sup>st</sup> Jan 2013 to 30<sup>th</sup> June 2014 sixty four patients with gluteal and arm abscesses were received in the surgical department of Avicenna Hospital Lahore. Age ranged between 1 year to 70 years (the mean age was 36.23 years), thirty (46.88%) of patients were female, and thirty four (53.12%) were male. History was taken, vital signs were checked, proper physical examination was done and blood sample was sent for hemoglobin (Hb), white bloods cells (WBC) and biochemical analysis, chest and pelvic radiogram were taken in patients with history of chest, spine and pelvic problems. After fasting blood sugar was done and the patients were

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brought to operative theater, the abscess site was drained by cruciate or elliptical incision, 50 cases under general anesthesia and 14 cases under local anesthesia. All loculi broken by sinus forceps, dressing done by fluffy gauze then discharged on the base of day case surgery to do daily dressing, postoperative analgesic were given in all patients, but antibiotic just prescribed for those with co-morbidities. Then the patients followed up for five weeks after complete recovery.

**RESULTS**

A total 64 patients were admitted in surgical department with H/O intramuscular injection who had planned incision and drainage of abscess. Patients of all ages were included in this study as shown in table: 1. Eighteen (28.120%) patients’ ranges from 1-10 years. Four (6.25 %) patients were from 11-20 years. Thirteen (20.31%) patients were 21-30 years. Twelve (18.75%) patients were 31-40 years 8(12.50%) patients were 41-50 years. Seven (10.93%) patients were 51-60 years. Two (3.12%) patients were above 60 years of age.

All age group patients were suffering from injection abscess but most commonly affected patients about (28.12%) were children from one to ten years of age. The other common group of patients was twenty one to forty years of age. All these patients had received injections from some local practitioners. The cause may be wrong techniques or the use of vials with multiple pricks and unsterile syringes.

Table 1: Incidence and age distribution of i/m injection abscess

Age in years	n	%age
1-10	18	28.12
11-20	4	6.25
21-30	13	20.31
31-40	12	18.75
41-50	8	12.50
51-60	7	10.93
>60	2	3.12

Table 2 Incidence of male and female distribution according to regions

Location	Male patient	Female patients
Gluteal Abscess	8(47.37%)	20(52.63%)
Deltoid Abscess	16(61.53%)	10(38.46%)

All of the cases had unilateral abscess. Thirty eight (59.38%) patients were having intragluteal abscess out of which twenty (52.63%) were female and eighteen (47.37%) were male. Twenty six patients (40.62%) had abscess on arms. Sixteen

(61.53%) male and ten (38.46%) patients were female shown in table 2.

No significant data regarding organisms was obtained from the culture of pus after incision and drainage. Only few patients had grown staph aureus and polymicrobial growth. One patient 35 years of age male was diagnosed a case of tuberculosis of soft tissue in arm who had chronic abscess in his right arm after injection and was treated with ATT for one year.

**DISCUSSION**

In this study thirty eight patients had gluteal abscess who received injections at private clinic. The reason may be wrong techniques, unsterile syringes and uses of multiple pricks in vials. In a study conducted in Sulaimani teaching hospital, surgery department, Sulaimani University in Kurdistan, Iraque 91% patients had gluteal abscess even after using disposable syringes by trained nurses or paramedical staff. It is a large percentage of cases getting abscess after intramuscular injections, so the reasons could be other than the unsterile techniques. The depth of subcutaneous tissue varies and depends on the sex and body weight of the patient. The most of the patients may have received the subcutaneous injections<sup>6</sup>. This is because of having more subcutaneous tissue in female in comparison to males, so intramuscular injection in female more liable to be subcutaneous. Obese patients with excessive subcutaneous fat and tissue are more vulnerable to get subcutaneous injection instead of intramuscular injection because of having more subcutaneous tissue in female in comparison to males.

In our locality the paramedics are used to mix different intramuscular medications in the same syringe to form a mixture of drugs which may lead to drug interaction and produce adverse effect at local site of injection, this mixture is usually a collection of analgesic, antibiotic or steroid.

Repeated injections to one side lead to repeated trauma, tissue damage, necrosis and fibrosis which interfere with drug diffusion leading to delay in absorption and susceptibility to infection<sup>7</sup>.

Associated co-morbidities are significant risk factors for development of abscesses after intramuscular injections especially in the presence of devitalized and necrotic tissue after subcutaneous injections of medications in immune compromised patients, the presence of pre-existing tissue necrosis in a hyperglycemic environment would provide excellent conditions for bacterial proliferation<sup>8</sup>.

The mean subcutaneous fat thickness in the gluteal region is 5.0±1.9 cm, with female patients

having a mean of 5.7±1.8 cm as opposed to 4.4±1.7 cm in male patients, because the buttock subcutaneous fat thickness exceeded the length of the most commonly used green (21 Gauge) needle for IM injections (3.8 cm), so the use of longer needles is suggested in the intragluteal injections especially in obese patients<sup>9</sup>.

## CONCLUSION

Our findings following this study suggests that Improper intramuscular injection techniques and various subcutaneous thicknesses according to sex and body weight in individuals are the main contributing factors in subcutaneous rather than intramuscular injection which lead to subcutaneous lipo-necrosis and abscess formation after intragluteal injection. One should avoid mixture of drugs for intramuscular injections and encourage use of separate syringe for each injection.

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