ORIGINAL ARTICLE

Frequency of Contributing Factors in Intramuscular Injection Abscess

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ABSTRACT

Aim: To determine the frequency of contributing factors in intramuscular injection abscess in adults.
Study design: Descriptive Cross-Sectional survey.
Settings: Surgical floor of Mayo hospital, Lahore.
Duration: One year from 01/01/2013 to 31/12/2013.
Methods: The study included 210 patients with abscess formation after intramuscular injection. The patients were observed for the presence of factors like personnel administering injection (skilled or Quack, a personnel called a quack when he or she pretend they have medical skills but actually they do not possess them), use of syringes (sterilized or unsterilized), sterilization of site (proper or improper), diabetes mellitus BSR>180mg/dl and obesity (BMI >30kg/m^2).
Results: The mean age of patients was 37.02 ± 13.651 years with age range of 17 to 60 years. There were 131(62.4%) males and 79(37.6%) female patients. Intramuscular injection was injected by quack in 183(87.1%) patients, by skilled personnel in 27(12.9%). Unsterilized syringe was used in 23 (11%) patients while improper sterilization of site was reported in 185(88.1%) patients. 137(65.2%) had Diabetes mellitus. There were 76(36.2%) patients who were obese while 134(63.8%) were presented with normal BMI.
Conclusion: Improper sterilization of site was the most common contributing factor followed by quack administering injection, diabetes mellitus, obesity and use of unsterilized syringes. All the patients were treated with incision and drainage followed by antibiotics.
Keywords: Contributing factors, intramuscular injection, abscess

INTRODUCTION

Abscess is a collection of pus in a tissue cavity due to an infectious process. It is a defensive reaction of tissue to prevent the spread of infection. The release of cytokines due to death of cells by foreign materials or organisms trigger an inflammatory response which increase the regional blood flow and draws large numbers of white blood cells resulting in pus formation. The cardinal symptoms and signs of inflammatory process are redness, heat, swelling, pain and loss of functions[1,2].

An intramuscular injection is a minor procedure whereby a drug is deposited in to a muscle via needle. Appropriate clinical practice needs to reflect considerations about needle length, gauge, and its sterilization to ensure that patients get the benefit of drug administration without adverse effects. Intramuscular injections can result in severe tissue trauma by creating a local entry point for bacteria[3].

Intramuscular injection has been used as a means of parenteral drug administration for more than a century. The incidence of developing a complication from intramuscular injection ranges from 0.4 to 19.3%. Abscess formation was the most common complication of intramuscular injections as in 21.5%[4,5].

The rationale of this study was that quackery is being practiced in the different areas of the country. It is evident that untrained personnel uses the unsterilized syringes that lead to different complications, they are documented in international research articles but no data is available regarding frequency of contributing factors that cause abscess. So through this study we generated baseline data in our local population.

METHODOLOGY

This study was conducted on 210 patients admitted in surgical floor of Mayo Hospital, Lahore in a period from 01st Jan 2013 to 31st Dec 2013 (1 year). It was a descriptive cross-sectional and patient selection was through non probability purposive sampling. All patients aged 18-60 years, both male and female having history/physical evidence of intramuscular injection with clinical diagnosis of abscess formation at the site of injection were included in the study. I/V

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drug abusers and patients with severe acne (on clinical examination) were not included in the study.

Demographics like name, age, gender and address were recorded. Then patients were interviewed to assess the contributing factors like personnel administering injection, use of syringes, sterilization of site, DM, and obesity causing abscess. All patients underwent surgery and antibiotics were administered to control post-operative complications and follow up was done as per routine. All the data was collected and analyzed using SPSS version 17. Quantitative variable like age was calculated as mean±SD. Qualitative variables like gender and contributing factors like personnel administering injection, use of syringes, sterilization of site, DM, and obesity was calculated as frequency and percentages.

RESULTS

There were 210 patients included in this study. The age range of the patients in study was from 17-60 years with the mean of 37.02±13.651. There were 131 (62.4%) males and 79 (37.6%) female patients with male to female ratio 1.66: 1 (Fig. 1). The mean weight of patients was 62.78±11.29 kg with the range of 40-100 kg. The mean BMI was 25.043±3.80 with the range of 19-34.2. The mean BSR was 131.14±45.79 with the range of 96-248 mg/dl. As per frequency of contributing factors is concerned, Intramuscular injection was injected by quack in 183(87.1%) patients, by skilled personnel in 27(12.9%). Unsterilized syringe was used in 23(11%) patients while improper sterilization of site was reported in 185(88.1%) patients. 137(65.2%) had Diabetes mellitus. There were 76(36.2%) patients who were obese while 134(63.8%) were presented with normal BMI (Fig. 2).

Fig. 1: Gender distribution

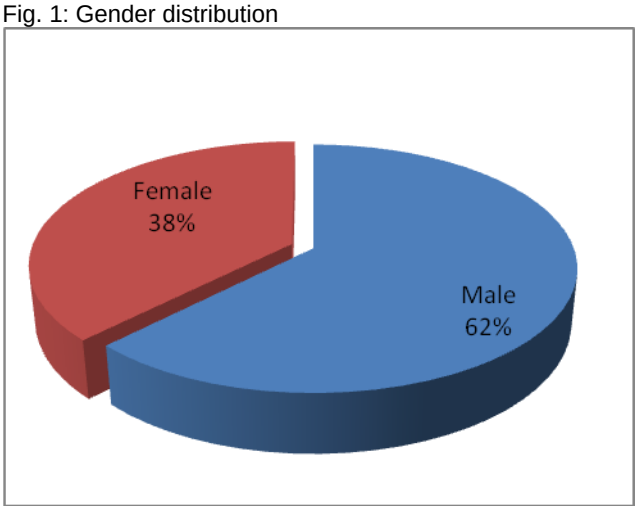
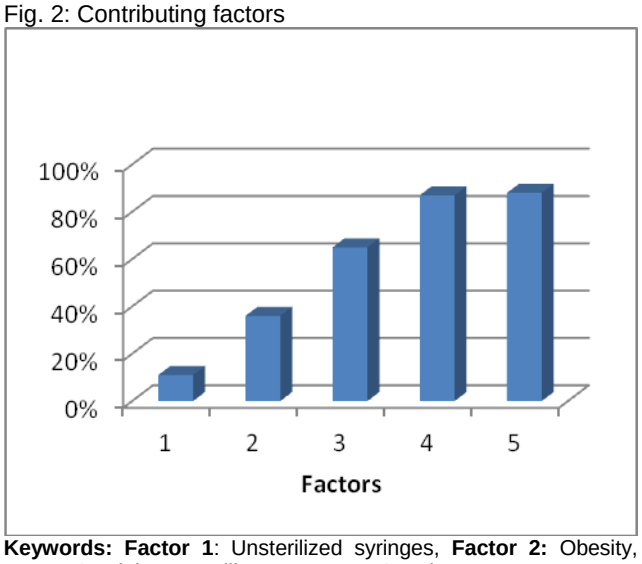


Fig. 2: Contributing factors



Keywords: **Factor 1**: Unsterilized syringes, **Factor 2:** Obesity, **Factor 3:** Diabetes mellitus, **Factor 4:** Quack, **Factor 5:** Improper sterilization of site

DISCUSSION

An intramuscular (IM) injection is a minor procedure whereby a drug is deposited into a muscle via a sterile needle. Most IM injections should be performed into the deltoid muscle in the arm, or into the gluteus maximus muscle in the buttocks[6]. Various studies have highlighted the importance of correct IM drug administration, in order to minimize the risk of potentially serious complications[7,8].

Appropriate clinical practice needs to reflect considerations about needle length, gauge and its sterilization to ensure that patients get the benefit of drug administration without adverse effects. Muscle tissue usually spared the harmful effects of substances injected into it, probably because of its abundant blood supply. However, deep IM injections can cause abscesses and granulomas, whereas more superficial IM injections may result in increased incidence of local reactions, such as irritation, inflammation and necrosis[6,9]. Most skin and skin structure infections either resolve without medical intervention or are treated with simple incision and drainage, some can lead to rare complications like sepsis, amputation and death[10].

In some countries, unsafe disposal can lead to re-sale of used equipment in the black market. Many countries have legislation or policies that mandate that healthcare professionals use a safety syringe (safety engineered needle) or alternative methods of administering medicines whenever possible. Open burning of syringes, which is considered unsafe by the World Health Organization, is reported in half of the non-industrialized countries. [11] According to one

study, unsafe injections cause an estimated 1.3 million early deaths each year[12].

Almost 40% of injections worldwide are administered with unsterilized, reused syringes and needles, and in some countries this proportion is 70%, exposing millions of people to infections[11,13]. In our study unsterilized syringes were used in 23 (11%) patients which is a lower statistics as compare to the above while improper sterilization of site was higher i.e., in 185 (88.1%) patients.

In literature there is no study discussing BMI, and blood sugar level of patients with intramuscular injection abscess. But it is said that layers of fat do not contain the appropriate cells that are necessary to initiate the immune response (phagocytic or antigen-presenting cells)[14]. The antigen may also take longer to reach the circulation after being deposited in fat, leading to a delay in processing by macrophages and eventually presentation to the T and B cells that are involved in the immune response. In addition, antigens may be denatured by enzymes if they remain in fat for hours or days. The importance of these factors is supported by the findings that thicker skin folds are associated with a lowered antibody response to vaccines[15,16]. We found that there were 76(36.2%) obese patients with intramuscular injection abscess.

Five seconds skin preparation with alcohol swabs prior to injection is supposed to reduce skin bacterial counts by over 82%. Diabetes mellitus may increase risk of abscess formation after intramuscular injection. A study on 13 diabetics found that injection site infection could be prevented after five seconds skin preparation[17]. On the contrary, another study stated that in general, skin contamination after intramuscular injection was minimal even without disinfection, thus skin cleansing may be considered as unnecessary procedure[18].

CONCLUSION

Improper sterilization of site was found to be the most common contributing factor for intramuscular injection abscess followed by quack administering the injection, diabetes mellitus, obesity and use of unsterilized syringes. All the patients were treated with incision and drainage followed by antibiotics. Further studies should be done in different settings to get more generalized results.

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