

Relation between Duration of healing of diabetic carbuncle to WBC count and Blood Sugar Level at time of presentation In Surgical Emergency of Mayo Hospital, Lahore

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ABSTRACT

Aim: To study the relation between duration of recovery of diabetic carbuncle with WBC count and blood sugar level at time of presentation in the Surgical emergency of Mayo Hospital, Lahore.

Methods: Prospective cohort study conducted and the effect of WBC count and blood sugar level at time of presentation on the recovery period of diabetic carbuncle was studied. The study was mainly carried out in Surgical Emergency Department of Mayo Hospital, Lahore.

Results: Total of 30 patients were studied and followed. The results have shown that people with High blood sugar level >300mg/dl at time of presentation and High WBC count took more time of recovery than those with blood sugar level <300mg/dl and WBC count within normal range.

Conclusion: Diabetic carbuncle took more healing time in patients presented with increased WBC count and poor glycemic control. It can be concluded that poor glycemic control and systemic infection is strong hindrance to early healing of diabetic carbuncle.

Keywords: Recovery period WBC count blood sugar level diabetic carbuncle

INTRODUCTION

A carbuncle is actually infective gangrene of skin and subcutaneous tissue, characterized by cluster of boils caused by bacterial infection, most commonly with *Staphylococcus aureus* or *Streptococcus pyogenes* and its presence is a sign that the immune system is active and fighting against the infection. It occurs when a group of adjacent hair follicles becomes deeply infected; *Staphylococcus aureus* is usually the pathogen. The incidence of boils is uncertain¹. In England, hospital admissions for severe staphylococcal boils and abscesses trebled between 1989 and 2004². The evidence to link diabetes with furunculosis (multiple crops of boils) is conflicting but when boils affect people with diabetes, they tend to be more extensive. The carbuncle affects adults and children's are spared. It mostly occurs in diabetics due to impaired leucocyte count. Carbuncle appears as tender painful lesion with cluster of severe boils filled with purulent discharge. It mostly occurs at the nape of the neck, the back, shoulder or thighs and sometimes associated with fever and malaise. Boils and carbuncles can leave scars. Carbuncles leads to some serious complications i.e., surrounding cellulitis or spread of infection through blood can cause osteomyelitis, infective endocarditis, brain abscess and cavernous sinus thrombosis but this is rare. There is a risk of secondary infection, which is when the infection spreads to other parts of the body. Septicemia is also very rare complication of both furuncles and carbuncle. The treatment of carbuncle is excision of all necrotic tissue with adequate surgical drainage of pus and broad spectrum antibiotics. It takes longer duration of healing by granulation.

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METHODS

The study performed was prospective cohort study at Emergency surgical Department of Mayo Hospital, Lahore. Sample of 30 were taken using non probability convenient sampling included all men and women came to surgical emergency department with diabetic carbuncle. Data was analyzed on Microsoft Excel and results were expressed by calculating Relative Risk and using tables in Microsoft word. Demographic data were recorded including name age sex address and contact number. Blood sugar level was recorded and one laboratory test was performed i.e. Complete Blood Count and phone calls were conducted to record duration of recovery period. 23 out of 30 underwent incision and drainage and 7 had excision. No significant ethical issues. Informed consent was taken from all patients.

RESULTS

Table 1: The study of relative risk between those having BSL \geq 250mg/dl and <250mg/dl at time of presentation in emergency with duration of recovery period (wound healing).

18 (a)	4 (b)
2 (c)	6 (d)

\geq 3months recovery period < 3months recovery period

BSL \geq 250mg/dl (22 people out of 30)

BSL < 250mg/dl (8 people out of 30)

Relative risk = disease among exposed \div disease among non-exposed

Relative risk = $a/a+b+c/d=18/18+4 \div 2/2+6= 0.81/0.25= 3.24$

Relative risk = 3.24

Interpretation: Relative risk calculated is showing that patient with BSL \geq 250mg/dl at time of presentation are at 3.24 greater risk of taking \geq 3month recovery period than those with BSL level <250mg/dl.

Table 2: The study of relative risk between those having WBC count $\geq 8,000$ and <8000 at time of presentation in emergency with duration of recovery period (wound healing).

13 (a)	3 (b)
7 (c)	7 (d)

≥ 3 months recovery period < 3 months recovery period

WBC count $\geq 8,000$ (16)

WBC count $< 8,000$ (14)

Relative risk = $a/a+b+c/d=13/13+3 \div 7/7+7 = 0.81 \div 0.5$

Relative risk = 1.62

Interpretation: Relative risk calculated is showing that patient with presenting WBC count $\geq 8,000$ at 1.62 times more at risk of taking ≥ 3 months recovery period than those with WBC count $< 8,000$.

DISCUSSION

A carbuncle is skin infection caused by bacteria, most commonly with *Staphylococcus aureus* or *Streptococcus pyogenes*. The infected material forms a lump, which occurs deep in the skin and often contains pus, infection is contagious and may spread to other areas of the body. Carbuncle is typically filled with purulent exudate (dead neutrophils, phagocytized bacteria, & other cellular components)⁵. The initial cause of a carbuncle can often not be determined. People with diabetes, dermatitis, and a weakened immune system are more prone to develop *Staphylococcus aureus* infection that can cause carbuncles. Risk factors include recent incidence of folliculitis, friction from clothing or shaving, having hair pulled out, poor hygiene, poor nutrition or weakened immunity. Obesity, diabetes, young age, smoking and prescription of an antibiotic in the six months before initial presentation have been shown to be associated with recurrent infection³. Carbuncles are commonly associated with diabetic patients.⁴ The carbuncle require both medical and surgical treatment to promote healing and minimize scarring and its treatment involves early administration of antibiotics and surgery⁴. Surgical treatment are divided between saucerization, and simple incision and drainage (I&D)^{4,5,6}. An active boil or carbuncle is contagious: the infection can spread to other parts of the person's body or to other people through skin-to-skin contact or the sharing of personal items. So it's important to practice appropriate self-care measures, like keeping the area clean and covered, until the carbuncle drains and heals^{7,8}. The role of ancillary antimicrobial therapy in the treatment of skin abscesses, furuncles, and carbuncles is uncertain⁹. Any process leading to a breach in the skin barrier can also predispose to the development of a skin abscesses, furuncle, or carbuncle. People of any age can develop carbuncles from irritations or abrasions to the skin surface caused by tight clothing, shaving, or insect bites, subcutaneous and intramuscular injections^{10,11,12}. According to our statistics diabetic carbuncle is more common among females and the most commonly involved site is nape of the neck, followed by back and shoulder and incision and drainage was done on 23 out of 30 people and

7 people underwent excision. Blood sugar level at presentation time was ≥ 250 mg/dl in 22 out of 30 patients and 16 out of 30 people had WBC count $\geq 8,000$ at time of presentation and these people at risk took more than ≥ 3 months for recovery. Shortages of time, non-co-operative behavior of patients, stigma to talk with strangers were major limitations of our study.

CONCLUSION

It can be concluded that patients presented with poor glycemic control and systemic infection took more time for healing of treated diabetic carbuncle than those with controlled blood sugar levels and had no systemic infection. By taking measures for keeping good glycemic control i.e. diet modification and excellent compliance and strong immunity i.e. use of healthy diet and good hygienic exercise can help people to get speedy healing of wound.

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