



A PROSPECTIVE OBSERVATIONAL STUDY ON SURGICAL INTERVENTION IN EARLY AND LATE CASES OF CARBUNCLE IN TYPE 2 DIABETES MELLITUS

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ABSTRACT **BACKGROUND:** carbuncle is aggregation of multiple furuncles that form an inflammatory mass. This typically drains on skin surface via openings. Patient may present with sepsis that require antibiotics administration and drainage. Diabetic patients who present late are often in septic shock with organ dysfunction.

Objectives: To evaluate differences on presentation, associated morbidity and mortality in diabetic patients with carbuncle who present early (<7 days) and late (>7 days).

MATERIALS AND METHODS: Our study included all patients admitted in surgical wards of JJMMC, Davanagere. This randomized prospective study comprising 40 patients of carbuncle over a period of 2 years.

INCLUSION CRITERIA: Patients >18 years, with confirmed and newly detected type 2 diabetes mellitus, acute or chronic lesions of carbuncle.

EXCLUSION CRITERIA: Patient <18 years of age, with carbuncle but non diabetic.

RESULTS: The Mean size of carbuncle in Early and late group was 8.85 cm and 13.45 cm respectively, significantly larger in late group. Sepsis at presentation was seen in 4 patients in early and 11 in late group, with significantly higher incidence in late group. DKAs seen in 2 patients in early and 13 in late group, significantly higher incidence in late group. The mean duration of hospital stay was 4.75 days in Early and 7.35 days in late group, with significantly longer stay in Late Group. The mean period of healing was 5 weeks in early and 7 weeks in late group, with significantly longer healing period in late Group.

KEYWORDS : Diabetes Mellitus, Carbuncle

INTRODUCTION

Diabetes mellitus is a serious chronic condition with potentially devastating complications that affects all age groups worldwide¹.

Staphylococcus aureus is one of the most common etiological agents of community-acquired and nosocomial bacterial infections².

Staphylococci are among the normal flora on the skin usually on nasal mucosa, axilla, or groin and are generally non-pathogenic, but can also cause boils, abscesses, carbuncles, and serious upper respiratory infections.

Skin and soft tissue infections are more common in diabetic population. Patients with diabetes have higher prevalence of staphylococcal skin and nasal carriage and this correlates with increased risk of local and systemic infections leading to significant morbidity and mortality.

Some soft tissue infections that are more prone to occur in diabetics include impetigo, furuncles and carbuncles, cellulitis, necrotizing fasciitis, and septic bursitis.

A carbuncle is aggregation of multiple furuncles that form an inflammatory mass. The infected necrotic centre is walled off by a pseudocapsule. Staphylococcus aureus is main culprit².

Carbuncle typically drains onto skin surface via several openings³. There is usually a rim of cellulitis and inflammation around central necrosis. Common site of occurrence is nape of neck and back. Skin in this area is thick. Condition also can occur in shoulder, cheek, hand, forearm. This condition is common in diabetics, males and after forty years of age. Control of diabetes is essential using insulin.

Antibiotics like penicillins, cephalosporins or depending on C/S is given. Diabetic patients who present late to hospital are often in septic shock. Patient may present with sepsis that require early antibiotics administration and drainage of infection³.

Drainage is done by cruciate incision and debridement of all dead tissues. Excision is done later. Once wound granulates well, skin

grafting may be required. Present study designed to assess morbidity and mortality associated with diabetic patients with carbuncle who present early (within 7 days of onset) and late (7 days later).

MATERIALS AND METHODS

Source Of Data: This randomized prospective study carried out on patients of J.J.M. Medical College, Davanagere, with institutional ethical committee approval. 40 patients of carbuncle were studied.

Study Design: randomized Prospective observational study

Study Location: This tertiary care teaching hospital based study done in Department of General Surgery, J.J.M. Medical College, Davanagere

Study Duration: May 2018-July 2020, over a period of 26 months.

Sample size: 40 patient

Patients >18 years, both male and females, confirmed and newly detected type 2 diabetes mellitus, with lesions of carbuncle were divided into two groups, early and late group and patients who had carbuncle lesions but non diabetic were excluded.

The data collected were on basis of duration of symptoms at time of presentation, size of carbuncle, complete hemogram, hbA1c, blood sugar, urine ketone bodies, discharge for C/S, duration of stay in hospital. All patients underwent excision for carbuncle. Patients were followed up for period of 3 months and assessed for wound healing and recurrences.

Opinions on the surgical treatment of this age-old condition are divided.

One group of surgeons believe that carbuncles should be widely excised in a technique called saucerisation^{4,5}. This includes excision of the necrotic centre and its surrounding cellulitis. The excision is deemed adequate when limits of surgery are healthy and completely uninfamed. Antibiotics may not be required after saucerization. This technique results in large wound, which is dressed and allowed to heal

by secondary intention. Occasionally, a very large wound can be closed with skin graft⁴. Some might even require musculocutaneous flap to cover the defect.

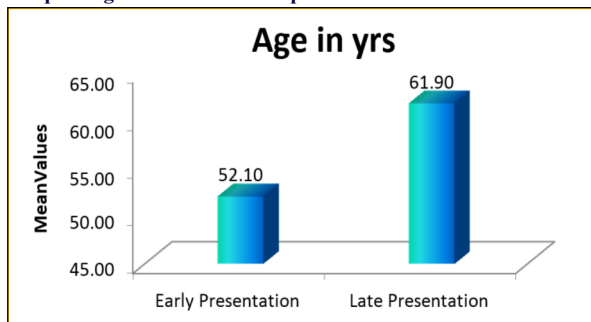
Another group of surgeons treat carbuncles by I&D, and debridement of only necrotic centre^{3,5}.The surrounding inflamed tissue is not excised but is instead treated with a course of antibiotics.The resulting wound is smaller.Similarly,it is dressed until it heals by secondary intention.This technique rarely requires grafting for wound cover because it heals fairly quickly. In comparison, the saucerised wound needed dressings for more than 8-weeks.

These data were tabulated, analysed and represented in form of frequency and percentage.Quantitative data represented as mean & Sd.Comparison of variables has been done with Paired t test.P value of <0.05was considered statistically significant.Data was analyzed with SPSS Version22. Institutional Ethical Clearance was obtained prior to starting the study.

RESULTS

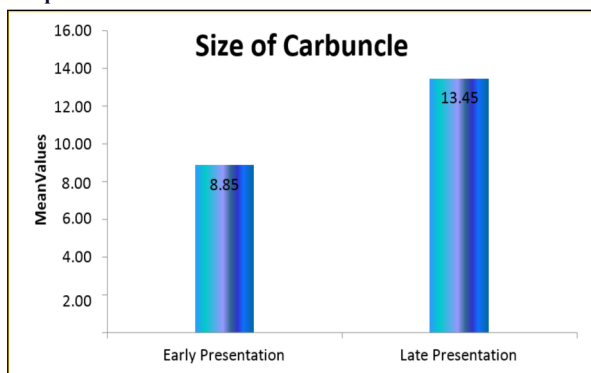
A Prospective comparative study consisting of 40 patients divided into two groups i.e. Early and Late Presentation group, are undertaken to study differences on presentation, associated morbidity and mortality between two groups.

Graph1: Age distribution of the patients studied



The mean age and SD in Early and late group was 52years,11.5 and 61years,12.4 respectively.Significantly older in late group in comparison to early group.

Graph2: Size of the carbuncle



Mean size and SD of the carbuncle in Early and late group was 8.85cm,3.38and13.45cm,4.48, P Value<0.001, with significantly larger carbuncles in the group.

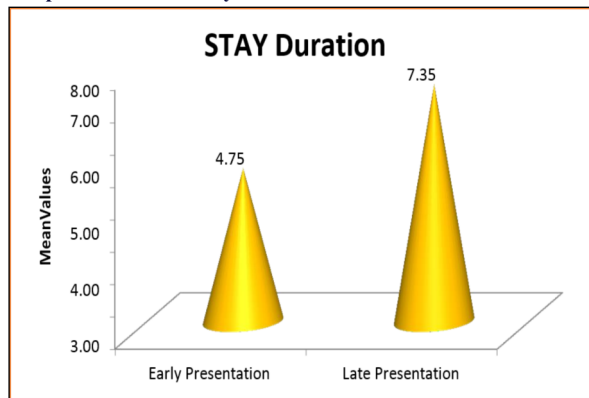
Table1:Sepsis

SEPSIS	Early Presentation		Late Presentation	
	Cases	Percent	Cases	Percent
YES	4	20	11	55
NO	16	80	9	45
Total	20	100	20	100

ChiSquare test P<0.02,Sig

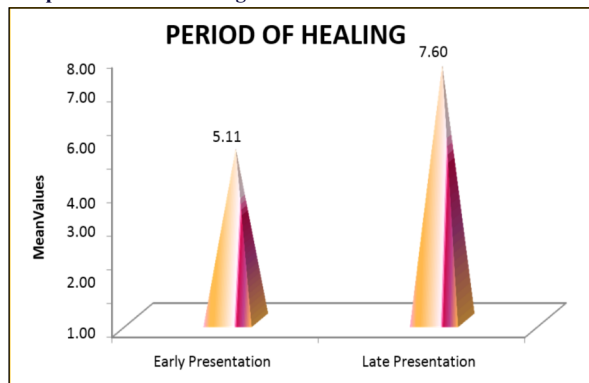
Sepsis at presentation was seen in 4 patients in the early group and 11 patients in the late group, with significantly higher incidence in the late group.

Graph3: Duration of stay



The mean duration of in-patient hospital stay in Early and Late group was 4.75days,2.83 and 7.35days,3.41 respectively, with P Value<0.01, significantly longer stay in Late Group.

Graph4: Period of Healing



The mean period of healing was 5 weeks in Early group and 7 weeks in Late group, P value<0.003, with significantly longer period of healing noted in Late Group.

DISCUSSION

Present study is designed to assess morbidity and mortality associated to diabetic patients with carbuncle who present early (within 7 days of onset of swelling) and late(later than 7days of onset of swelling).

A Prospective comparative study consisting of 40 patients divided into two groups i.e. Early presentation group and Late Presentation group, are undertaken to study the differences on presentation, associated morbidity and mortality between two groups.

The study population were known diabetics on regular or irregular treatment, though a few cases were newly detected diabetes. No significant difference was noted in two groups in terms of gender distribution and duration of diabetes in Early and Late group.

AGE

The mean age in Early and late group was 52years and 61years respectively. Older patients presented late in comparison to younger age group, and had a poorer prognosis when compared to Early group.

Size Of The Carbuncle

Mean size of carbuncle in Early group was 8.85 cm and in the late group was13.45 cm. The size of the carbuncle in majority of the patients corresponds linearly with duration at presentation, smaller carbuncles presenting in early group and larger carbuncles in late group suggests that late group was associated with comparatively larger carbuncles and therefore increases morbidity associated with late group.

Sepsis

Sepsis at presentation was seen in 4 patients in early group and 11 patients in late group, with significantly higher incidence in late group. Sepsis in majority of patients corresponds linearly with duration at presentation, with increased incidence in late group. This suggests that late group is associated with comparatively higher incidence of sepsis

and therefore adds to increased morbidity and mortality associated with late group.

Duration Of Stay

The mean duration of in-patient hospital stay was 4.75 days in Early and 7.35 days in Late group, with significantly longer stay noted in Late Group. Duration of hospital stay in majority of patients corresponds linearly with duration at presentation, with increased Duration in late group. This correlation suggests that late group is associated with comparatively Longer duration of in-patient hospital stay and therefore adds to increased morbidity associated with late group.

Period Of Healing

The mean period of healing was 5 weeks in Early group and 7 weeks in Late group, with significantly longer period of healing noted in Late Group. Longer period of healing adds to increased morbidity of patient in terms of need for more number of dressings, hospital visits and higher psychological stress and expenditure.

Recurrence

Recurrence was noted in 2 patients in early group and 5 patients in late group. Incidence of recurrence did not differ significantly in both groups, though recurrence in this study was attributed to poor adherence of patient to advised post-operative instructions, diabetic control, and follow up.

CONCLUSION

Present Study helps infer that Surgery in Diabetic patients with carbuncle, who present late i.e. after 7 days of onset of swelling are associated with increased morbidity in terms of larger size of carbuncle, increased incidence of Sepsis, longer duration of stay and period of healing. Recurrence and mortality were not significantly affected by the duration of presentation in our study and were attributed to poor adherence of patient to advised post-operative instructions, diabetic control, follow up.

We can conclude that Surgical Intervention in late presentation of diabetic patients with carbuncles is associated with poor prognosis and increased morbidity in comparison to early presentation.

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