A CORRELATION STUDY OF ULCER STATUS WITH BACTERIAL COLONIZATION AND INVASION

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Wound biopsy is a reliable way of diagnosing wound infection in patients with chronic ulcer of the limbs and in burn patients. The biopsy specimen is subjected to both histological and microbiological analysis. While wound swabs often cultured mixed contaminants, biopsy specimens usually reveal single organism growth. This is a prospective study of fifty patients with chronic leg ulcers attending surgical outpatient department over a period of 10 months. The ulcers were subjected to histopathology study. The clinical status of the ulcers were correlated with the histopathology result. There was both statistical and clinical significance between the ABDEFS' and HISTOPATHOLOGY scores. A clinician can therefore reasonably predict the degree of bacterial invasion of the ulcer based on the assessment of its clinical appearance and thus commence appropriate treatment before further complication sets in.

INTRODUCTION

Wound biopsy is a reliable way of diagnosing wound infection in patients with burn injury and those with chronic ulcers of the limbs. While wound swabs often culture mixed contaminants, biopsy specimens usually reveal single organism growth. The depth of bacterial invasion may be a pointer to some dangerous complications that can arise from chronic ulcer. For example, a perivascular invasion of the bacterial may be a pointer to an imminent speticaemia. Clinical status of an ulcer can be assessed and monitored by various wound severity scoring systems that have been devised by some workers. However, Oluwatosin et al (1) formulated a reliable and simple system called ABDEFS' scoring system in a study conducted at the University College Hospital, Ibadan. The scoring system was used in a study which showed a clinical correlation between the bacterial count of an ulcer and the clinical status of the ulcer. This study is performed as an extension of the previous one to see if the histology of the biopsy specimen has any correlation with the clinical status of the ulcer.

PATIENTS AND METHODS

Forty patients with chronic leg ulcers attending the surgical outpatient department of the University College Hospital, Ibadan were studied. Study period was ten months from December 1999 to September 2000. Patients with malignant ulcer as well as diabetics and patients with haemoglobingpathy were excluded from the study. The ulcers were assessed using ABDEFS' scoring system by a Registrar in the division of plastic surgery. The wound biopsies were taken after injecting the biopsy site with xylocaine and adrenaline local anaesthetic agents. The specimens were sent to histophathology laboratory of the hospital for analysis. The clinical status of the ulcer was correlated with the histopathology results. The analysis was performed using SPSS –9 for windows statistical package. Level of statistical significance was taken to be P<0.05 and a 95% confidence interval applied.

The ulcers were scored as follows:

		Scores
A. aetiology -		
	(i) Local	1
	(ii) Controlled systemic disease	2
	(iii) Systemic disease uncontrolled	3
	(iv) Malignancy	4
B. Base	(i) Soft, mobile	1
	(ii) Hard, fixed	2
D. Discharge		
	(i) Slight to moderate	1
	(ii) Compious, purulent	2
E. Edge	(i) Flat, shelving, punched out	1
	(ii) Undermined, raised	2
F. Floor	(i) Predominantly granulation	1
	(ii) Predominantly sloughy	2
S. Size	(i) <2.5cm in dimension	1
	(ii) >2.5cm in dimension	2

Total score was applied for each of the patients maximum score being 14. the histopathology resul was scored as follows:

(i)	No pathogens, only granulation tissue	1
(ii)	No pathgens but pus cells present	2
(iii)	Colonization, that is, organisms present in non-viable tissue	3
(iv)	Bacterial invasion of viable tissue	4
(v)	Perivascular invasion	5

RESULTS

Thirty four out of expected forty results were analyzed. The histopathology studies were carried out by three consultants in the pathology department of the hospital depending on who was on duty the day the specimens were processed.

The mean (sd) age of the patients was 40.76(18.16), most of the cases of the chronic leg

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ulcers were secondary to poorly treated traumatic ulcers. The mean (sd) ABDEFS score was 8.26(1.82) while the mean (sd) histopathology score was 2.10(1.11) as shown in table 1. This means that on the average there were no pathogens but presence of pus cells in the biopsed tissue. There were few cases of bacterial invasion of normal tissue and only in one case did the histopathology result reveal pervascular invasion.

TABLE I : **DESCRIPTIVE STATISTIC ON HISTOPTHOLOGY ABDEFS AND AGE**

	Mean	Standard Deviation	N
HISTOPATHOLGOY	2.10,	1.11	34
ABDEFS	8.21	1.82	34
AGE	40.76	18.16	34

		HISTOPATHLOGY	ABDEFS
Pearson correlation	HISTOPATHOLOGY	1.000	0.440
	ABDEFS	0.440	1.000
Singnificance(1-tailed)	HISTOPATHOLOGY		.005
	ABDEFS	.005	
N	HISTOPATHOLOGY	34	34
	ABDEFS	34	34

95% CONFIDENCE INTERVAL FOR

Lower Band		Upper Bound
Constant	- 1.769	1.544
Coefficient of x	0.071	0.465

Linear Regression equation. $Y = 0.44x$
When y = Histopathology score
X = Abdefs score.

TABLE II: **CORRELATIONS BETWEEN HISTOPA-THOLOGY AND ABDEFS SCORES**

Pearsons correlation results are expressed in table 2. it showed a P-value of 0.005 which is less than 0.05. The correlation coefficient ® value of 0.440 fell within the 95% confidence interval of values showed in table 2. There is therefore both statistical and clinical significance between the ABDEFS' and HISTOPATHOLOGY scores. The histopathology score, that is, the degree of bacterial invasion can be calculated by using the linear regression equation obtained in this study. $y = 0.44x$ where y = HISTOPA-THOLOGY and x = ABDEFS.

DISCUSSION

Various wound severity scoring system have been devised by different workers. David Kinghton et al₃

made use of wound scores based on general wound parameters, anatomic consideration and wound measurements. Some of these scoring systems are not easily applicable in this environment. ABDEFS scoring method is a simple and reliable means of evaluating ulcers[1,2] The current emphasis in medical statistics is to report results in a way that is not only statistically significant but also clinically meaningful[4,5] In this study the p-value of 0.005 and correlation coefficient ® value of 0.440 which falls within 95% confidence interval established both statistical and clinical significance between the ABDEFS' scoring system and histopathology result of an ulcer.

Since histopathology study is not readily available in some centers, it will be most appreciable if a clinician can predict the clinical state of an ulcer with respect to the degree of bacterial invasion. The depth of bacterial invasion may be a pointer to some dangerous complications that can arise from chronic ulcer. For example, a perivascular invasion by bacteria may be a point to an imminent septicaemia. Using the ABDEFS' scoring system, a clinician in peripheral and some general hospitals in Nigeria can predict the degree of bacterial invasion of the ulcer based on assessment of its clinical appearance and thus commence appropriate treatment before further complication set in. For example an ulcer whose appearance has been scored as eight will be expected to have histopathology sore of [3,5] This study constitute a beneficial additional adjunct to the previous study of the correlation of the clinical status of an ulcer with the bacterial count of the ulcer biopsy.

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