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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1479380>Available online at: <http://www.iajps.com>**Research Article****PREVALENCE AND ASSOCIATED FACTORS OF SUPERFICIAL  
BACTERIAL INFECTIONS AMONG PATIENTS ATTENDING  
GAMBELLA HOSPITAL, GAMBELLA REGIONAL STATE, SOUTH  
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**Abstract:**

**Background:** Skin diseases in developing world have stimulated a lot of interest over the years because they are potentially preventable and controllable where high prevalence figures (21%–87%) have been reported and usually are not well managed. The burden of superficial bacterial infection was also high in Ethiopia, with different prevalence rate at different parts of the country. However, there is no recent information on the prevalence and associated factors of superficial bacterial infection in our study area.

**Objectives:** The objective of this study was to assess the prevalence and associated factors of superficial bacterial infection among patients attending Gambella Hospital from Nov, 2014- Mar, 2015 G.C

**Methods:** Institution based cross-sectional study design was conducted at Gambella Hospital on 258 patients who attended the hospital for any skin disease from Nov, 2014- Mar, 2015 G.C. Consecutive convenience sampling technique was employed to recruit patients with superficial bacterial infection from the study population. A structured questionnaire for participant interview and structured checklist for physical examination was used.

Data, which was collected by interview and physical examination, were cleaned, coded, and entered to SPSS version20 for analysis. Analysis of data was carried out by considering Chi-square, bivariate and multivariate logistic regression. Descriptive statistics were calculated including frequencies, percentages, mean, and standard deviation for variable under study.

**Result:** Among the 258 participants, 98(38.0%) cases of superficial bacterial infections were found of which impetigo (37.80 %) was the commonest. It was found that superficial bacterial infection varies with age and higher prevalence was observed in children of less than ten years of age as compared to those above thirty one years of age [AOR= 2.673, 95% CI, (1.13, 6.325)]. It was noted that family size and educational level were associated with an increased incidence of superficial bacterial infection ( $P=0.010$  and  $p=0.001$ , respectively). Moreover it was found that superficial bacterial infection varies with HIV serostatus and higher prevalence was observed in reactive groups as compared to the nonreactive group [AOR=5.655, 95% CI, (1.154, 27.703)].

**Conclusion:** Superficial bacterial infection was a major problem, particularly among children of less than ten years of age group and in those reactive for HIV

**Key words:** Prevalence, Superficial Bacterial Infection, Hospital

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## INTRODUCTION:

### Background

Pyoderma is infections in the epidermis, just below the stratum corneum or in hair follicle which include impetigo, ecthyma, folliculitis, furuncle, carbuncle and botryomycosis (1, 2). Although skin disease is rarely lethal (7), in delayed diagnosis or inadequate treatment some infections, for example bacterial infections, have the potential for serious sequelae such as nephritis, carditis, arthritis, and septicemia (8). On the other hand, skin diseases particularly in children may result in considerable discomfort, anxiety, and embarrassment and unnecessary absence from school and work. The pattern of skin diseases in any community is influenced by genetic constitution, climate condition, socioeconomic status, occupation, educational background, personal hygiene, customs, quality of medical care, family size, family history and overcrowding in school or household (9, 10, 15, 22).. Skin diseases in developing world have stimulated a lot of interest over the years because they are potentially preventable and controllable and because skin diseases also serve as an index of community development (23). The epidemiologic statistics of skin diseases provide us with information about prevalence, age, and sex differences in affected groups, and their regional distribution (28). Although superficial bacterial infection in developing countries are present in large numbers, only few studies on this subject are available and they have so far not been regarded as a significant health problem in the development of public health strategies.

### Justification of the study

The goal of this study is to determine the actual extent of the superficial bacterial infections among patients attending Gambella hospital & also to detect possible sociodemographic risk factors implicated in their development, with the hope of making a significant contribution towards improving the quality of services provided for the patients. Furthermore, the result of the research will be used as basis for further study in the area.

## METHODS AND MATERIALS:

**Study area and period:** Gambella region lies approximately 777 kms to the west of Addis Ababa. The region is located in the south-western part of the country and borders the Oromia region to the north and northeast and Southern Nations Nationalities and Peoples' (SNNP) region to the south and southeast. The region also shares an international boundary with South Sudan to the west. Total population of the region is estimated to be 396,000 (19)

**Study design;** Institution based cross sectional study design was used in order to assess the prevalence and associated factors of superficial bacterial infection among patients attending Gambella hospital.

**Source population;** all patients who had visited Gambella hospital outpatient department for any skin problems

**Study population;** All patients attended OPD in Gambella Hospital from Nov, 2014- Mar, 2015 G.C for any skin problems

### Data collection tools and procedures

Following an interview and brief history of symptoms a physical examination of the whole body was conducted. The clinical diagnosis of superficial bacterial infection was made according to, Fitzpatrick's text book of dermatology, diagnostic criteria. The diagnosis was made based on the clinical finding and laboratory investigation was not done. Patients with superficial bacterial infection were given appropriate treatment and advice.

### Ethical consideration

Ethical clearance was obtained from the Ethics Review Committee of Gambella teachers education and Health Sciences College. Permission was obtained from medical director of the hospital. Information obtained from the patients did not disclosed to any third person. Patient's identification variables such as name, house number, telephone, were not used in the study. Informed and written consent was provided by the patients with a clear description of objectives and procedures. This study did not inflict harm on or expose patients to unnecessary risk as a result of interview and physical examination.

## RESULTS:

### Sociodemographic and economic characteristics of the study Participants

A total of 258 patients who attended the dermatologic clinic during the study period were included in the analysis with the response rate of 100%. The age of the patients included in the study was ranged from 1-70 years old with a mean of 19.95 years of age and SD  $\pm$ 13.795. The highest number of patient in this series was between the ranges 0-10 years of age making 32.2% of the total.

### Distribution of superficial bacterial infection in relation to their clinical types

The overall point prevalence of superficial bacterial infection was 38.0% in this study. In which impetigo was the most common (37.8%) among other types of superficial bacterial infection (Fig.1)

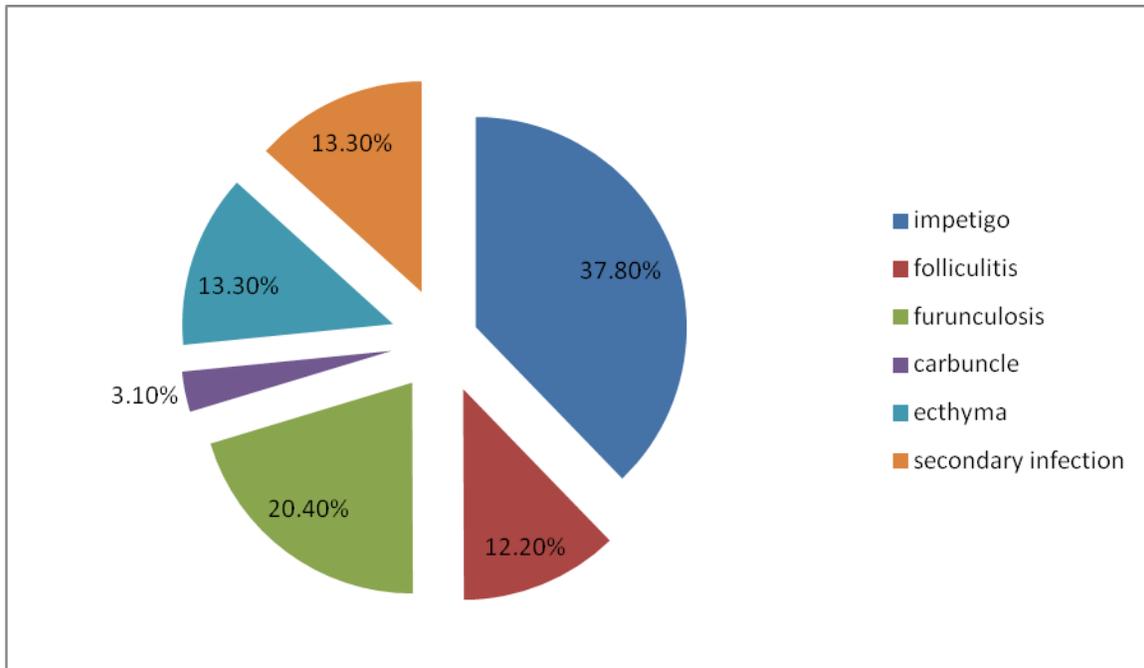


Figure1. Types of superficial bacterial infection in Gambella hospital, OPD, Gambella, Ethiopia, Mar, 2015 (N=98)

#### **Distribution of superficial bacterial infection in relation to the hygiene status**

Regarding the personal hygiene status of the respondents, the prevalence of superficial bacterial infection was 41.8% in those who take shower once a week. As of the presence of tap water at home the prevalence of superficial bacterial infection was 52.8% in those who don't have tap water at their home. As far as the hand washing was concerned the prevalence of superficial bacterial infection was 39.6% in those who wash their hands three times a day. Regarding the use of soap the prevalence of superficial bacterial infection was 60.0% in those who don't use soap while washing their hands and body. Moreover the result of the current study shows that the prevalence of the disease was 42.0% in those who use soap only some times. Regarding sharing of beds the prevalence of 42.1% was found in those sharing beds with other individuals. Moreover according to the result of present study the prevalence of superficial bacterial infection was found to be 40.2% in those who share towels with others

#### **Distribution of superficial bacterial infection in relation to clinical conditions**

Regarding the disease duration more than half, (62.1%) of the cases are less than three weeks. And one fourth (25.5%) of the case have history of two to four time recurrence rate per year. Concerning the history of previous treatment 37.5% of the cases have reported that they have been treated. Among the case seventy nine (45.7%) of them have associated

pruritus. As far as similar problem in family was concerned 54.2% of the cases have reported for the presence of the same problem in their family members. Regarding the use of drug 40.6% of the cases have used drug. Among the drugs used by respondent's antibiotics was the leading which was used by 65.0% of the cases. Seventeen (51.5%) of the respondents have history of insect bite. Regarding the history of trauma 60.0% of the cases have reported that they have experienced different types of trauma that disrupt skin barrier. 36.7% of respondents with superficial bacterial infection have personal history of atopy and those who have family history of atopy were 32.3%. Regarding the HIV serostatus of the cases twelve (63.2%) of them were found to be reactive.

#### **Socio-demographic and socioeconomic determinants of superficial bacterial infection**

Comparison between cases having superficial bacterial infection and those who don't have was made for difference in socio demographic and socio-economic determinants of superficial bacterial infection after adjusting for, Age, sex, level of education, residence, monthly income and family size accordingly, there was statistically significant association between superficial bacterial infection and age. The likelihood of having superficial bacterial infection among children of less than ten years was found to be higher compared to those above thirty one years of age group [ AOR= 2.673,95% CI, (1.13,6.325)](Table 4). Moreover,

educational status was another predictor for superficial bacterial infection. The likelihood of acquiring superficial bacterial infection was twelve times higher in those who can't read and write when

compared with those who have attended diploma and above group [AOR=12.163,95% CI ,( 2.309,64.065)](Table 1).

**Table 1: Sociodemographic and socioeconomic determinants of superficial bacterial infection in Gambella hospital, OPD, Gambella, Ethiopia, Mar, 2015 (N.258)**

Sociodemographic characteristics	Superficial bacterial infection				
	No(%)		COR(95% CI)	P.Value	AOR(95% CI)
	Yes	No			
Age					
0-10	44(53.0%)	39(40.0)	2.538(1.135,5.678)	.025	2.673(1.13,6.325)
11-20	21(31.8%)	45(68.2)	1.050(.447,2.468)	.443	1.449(.562,3.736)
21-30	21(30.0%)	49(70.2)	.964(.412,2.258)	.206	1.878(.707,4.986)
31 and above	12(30.8%)	27(69.2)	1		
Educational level					
Can't read and write	43(53.8%)	37(46.2)	13.946(3.087,63.00)	.001	12.163(2.309,64.065)
Grade 1-8	40(38.5%)	64(61.5)	7.500(1.681,33.465)	.008	6.729(1.318,34.352)
Grade 9-12	13(27.1%)	35(72.9)	4.457(.921,21.568)	.063	4.247(.809,22.302)
Diploma and above	2(7.7%)	24(92.3)	1		
Family size					
< 4	20(26.0%)	57(74.0)	1		
≥ 5	78(43.1%)	103(56.9)	2.158(1.199,3.887)	.010	2.312(1.214,4.403)

There was statistically significant difference between superficial bacterial infection and monthly incomes and residence of participants, however, after adjusting for certain variables mentioned above their significance has failed to resist. Moreover, there was no statistically significant association between superficial bacterial infection and sex, number of rooms and property of house in this study (Table 1).

#### **Clinical and hygienic determinants of superficial bacterial infection**

Comparison between cases having superficial bacterial infection and those who don't have was made for difference in clinical conditions and determinants of superficial bacterial infection after adjusting for some variables. Accordingly, there was statistically significant association between superficial bacterial infection and HIV serostatus. The likelihood of having superficial bacterial infection among HIV positives was found to be higher as compared to the HIV negative group [AOR=5.655,95% CI, (1.154,27.703)] (Table2).

**Table 2:** Clinical and hygienic determinants of superficial bacterial infection in Gambella hospital, OPD, Gambella, Ethiopia, Mar, 2015 (N=258)

Disease related clinical condition	Superficial bacterial infection				
	No (%)		COR(95% CI)	P.Value	AOR(95% CI)
	Yes	No			
Duration					
< Three weeks	59(62.1%)	36(37.9)	5.706(3.145,10.353)	.000	2.974(.855,10.341)
Four – eight weeks	12(28.6%)	30(71.4)	1.393(.629,3.082)	.414	1.733(.316,9.514)
>eight weeks	27(22.3%)	94(77.4)	1		
Presence of pruritus					
Yes	79(45.7%)	94(54.3)	2.919(1.616,5.274)	.000	4.541(.959,21.490)
No	19(22.4%)	66(77.6)	1		
Type of drug used					
Corticosteroid	10(45.5%)	12(54.5)	4.182(1.149,15.219)	.030	3.529(.316,39.363)
Antibiotics	13(65.0%)	7(35.0)	8.5432.250,32.431)	.002	4.405(.294,66.026)
Others	5(18.5%)	22(81.5)	1		
Result of HIV test					
Reactive	12(63.2)	7(36.8)	5.048(1.723,14.784)*	.003	5.655(1.154,27.703)*
Nonreactive	18(25.4)	53(74.6)	1		

\* Significant association (P.Value<0.05) There was no statistically significant association between superficial bacterial infection and hygienic status, personal or family history of atopy, chronic illness, history of trauma and insect bite in this study.

### DISCUSSION:

This study presents the report of 258 patients from O.P.D of Gambella hospital, Gambella regional state, Ethiopia.. The current study found the overall prevalence of superficial bacterial infection of 38.0% which was slightly higher from results reported previously from AAU(Ethiopia), Egypt, Pakistan, Nigeria and southern Ethiopia which was 18.7%,23.4%,26.3%,30.7% and 33% respectively(6,7). The study in Dermatology O.P.D of Gauhati Medical College in India by Das KK, 2003 found the prevalence of Pyoderma to be 34.29 % ( 8). The study in the tertiary care hospital in Kerala by N. Asokan, 2009 found 36.74% of superficial bacterial infection (9).A Study from Northern India has reported prevalence of superficial bacterial infection as 64.4% which includes impetigo, and folliculitis and infected arthropod bite (11). According to a study done in Lahore, Pakistan, the prevalence of superficial bacterial infection was 26.3% where Impetigo, Folliculitis, Ecthyma and

furuncles accounts for 47.4%, 21.9%, 15.2%, 12.0%, respectively (12). Another study in West Bengal by Sudip Das & others in Dermatology O.P.D. of a Tertiary care hospital found prevalence of superficial bacterial infection more than the present study. This variation of superficial bacterial infection could possibly be explained by the season of the study period and Sociodemographic difference (15). According to the current study the prevalence of superficial bacterial infection was more common in children with significant association (P.Value 0.03) in line with different studies done at different parts of the world. A study done in Cameroon have reported higher prevalence of superficial bacterial infection in children of less than ten years of age with P.Value =.0543(6). Moreover studies done in Canada, UAE, Saudi Arabia, Egypt and Nigeria found different prevalence of superficial bacterial infection which was 5.7%, 2.55%, 9.48%, 23.4% and 30.7% respectively.in children(4,9,15,21). Same study done by Figoeara et.al at south Ethiopia decades ago has reported that 61% of cases were seen in children of 0-

14 years of age (42). This difference is probably because children are often exposed to climatic and social conditions that predispose them to develop skin infections & suffer from minor skin injuries (19). Regarding the educational level the prevalence of superficial bacterial infection was twelve times higher in those who can't read and write than who have attended diploma and above. The difference has statistically significant association **AOR= 12.163, 95% CI, (2.309, 64.065)**. Similarly, a study done in Cameroon have reported higher prevalence of superficial bacterial infection with statistically significant association ( $P=0.029$ ) in those who didn't attend formal school (41). This could be explained by that individuals with higher educational level have better awareness and practice on personal and environmental hygiene. As far as the family size was concerned, this study have found that the prevalence of superficial bacterial infection was higher in overcrowded groups as compared to non-overcrowded groups **AOR=2.312, 95% CI(1.214, 4.403)**. This was in line with study done in two villages in southwestern Ethiopia by Jose I Figueroa which have found statistically significant association between superficial bacterial infection and overcrowded condition with  $OR=2.3$  for S/UO ( $P=.00003, CI=1.5, 3.4$ ) and  $2.6$  for Kische ( $P=0.0001, CI=1.5, 4.4$ ) (42). Which could be explained by that peoples in overcrowded condition can easily acquire or transmit communicable disease by increased frequency of body contact. The most interesting finding of the current study was that the prevalence of superficial bacterial infection was higher in the HIV patients as compared to nonreactive groups [**AOR= 5.655, 95% CI, (1.154, 27.703)**]. This could be explained by that patients with HIV/AIDS have compromised immune systems which predispose them to different infectious pathogens moreover they are at risk of acquiring drug resistant bacterial species and strains (1). But as far as my knowledge is concerned there was no similar study which support or disprove this finding in Ethiopia or somewhere else.

#### CONCLUSION AND RECOMMENDATION:

Our study has found that superficial bacterial infections were a major problem particularly among children of less than ten years of age group, in HIV patients and in peoples living in overcrowded condition. Emphasis should be placed on this group of common skin diseases at all levels of personal health care, and suitable public health policies should be implemented in order to manage the problem rationally. So as to improve care and alleviate the burden on patients the ministry of health should

incorporate dermatologic care in to the health extension package program.

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