Staphylococci Species in Patients, Cows and Abattoir Stagnant Water from Eleven Local Government Areas of Ibadan

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Abstract: *Staphylococci species were isolated and level of occurrence determined in faeces and urine samples collected from patients attending treatments in health centres, stagnant water from slaughtering ground in abattoirs and cow blood in eleven Local Government Areas (LGA) of Ibadan. Standard pour plate method was used to isolate for enumeration and characterization of staphylococci species. Five different species of staphylococci were identified as S. aureus. S. haemolyticus, S. pseudointermedius, S. Saprophyticus and S. captivis. In all samples, Staphylococcus aureus was the most frequent specie followed by S. haemolyticus, S. Pseudointemedius, S. Saprophyticus and S. captivis. Patients from Lagelu LGA exhibited highest Staphylococcal loads of $1.93x10^2$ cfu/ml in faeces and lowest in urine sample with load of $1.07x10^2$ cfu/ml in patients from Oluyole Local Government Areas.*
Keywords*: Ibadan, Staphylococci, population, occurrence, identification. samples*

I.   Introduction

Staphylococcus spp. is common in nature. They are found everywhere and are flora of humans. *Staphylococcus aureus* belong to the Micrococcaceae family, is a Gram-positive, catalase, and coagulase-positive bacteria and asporous in nature, it is among the bacteria that are most resistant to the external environment and disinfectant agents. Some resistant isolates can be a source of clinical situations varying between superficial infections and serious life-threatening infections. Therefore, S. aureus should be frequently isolated from the community and hospital-acquired infections (Ryan and Ray 2010; Murray,e tal ,2005)

Hospital-acquired methicillin-resistant *S. aureus* (MRSA) infections are the factors held most responsible for mortality and morbidity in Turkey and the world. MRSA can easily be spread from patient to patient through the hands of the staff and can lead to frequent epidemics (Verloo et al., 2008; Koçak et al., .2012).

To date, seven species of coagulase4positive staphylococci (CoPS) have been identified namely;
Staphylococcus aureus, *S. intermedius*, *S. schleiferi* subsp. coagulans, *S. hyicus*, *S. lutrae*, *S.*

delphini, and *S. pseudintermedius* (.Devriese *et al*., 2005). Out of the above mentioned species of coagulase producing Staphylococci, *Staphylococcus aureus*, is the only coagulase positive species associated with humans (Devriese et al., 2005). Other species are associated with animals, the species include; *Staphylococcus intermedius*, *Staphylococcus delphini*, *Staphylococcus lutrae* and some strains of *Staphylococcus hyicus* (.Komori, 2001). Isolates such as *Staphylococcus lugdunensis* and *Staphylococcus schleiferi* can be occasionally mistaken for coagulase positive Staphylococci because of the presence of clumping factor (Vandenesch and Lina, 2012).

II. Materials And Methods

Samples

Faeces and urine samples from patients attending health centres, fresh cow meat, stagnant water from slaughtering ground in abbatoirs and cow blood were each collected from eleven Local Government Areas (L.G.A) of Ibadan (Akiyele, Ibadan North, Ibadan North East, Ibadan South West, Ibadan South East, Lagelu, Oluyole, Egbeda, Ona-ara, Iddo and Ibadan North West Local Government Area). The samples were collected in sterile covered vacuum tubes and packed in a food flask activated with ice cubes. They were transported to laboratory within one hour of collection for analysis.

Samples Preparation

One gram of faecal sample, fresh meat were ground with mortar and pestle while urine, blood and stagnant water were suspended in saline solution. Each of the samples was serially diluted and 1 ml each was

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pour plated in mannitol salt agar with the criteria of Jideani and Jideani, (2006). The plates were ncubated at 37 ^{o}C for 2 8hrs. Grown colonies were counted and expressed as colony forming unit per I ml of sample (cfu/ml).

Identification of Isolates
Staphylococci species isolated were identified using the method of Jideani and Jideani, (2004) through catalase, carbohydrate utilization, starch hydrolysis and citrate utilization tests.

III. Results
The staphylococci load from patients attending health centres in each Local Government Areas (Table 1) was compared with each other, the highest load is from Urine in Ibadan South West Local Government with 8.67 x10^{2} cfu/ml and the lowest is from feaces in Ona-Ara Local Government Areas with 1.0 x10^{2}cfu/ml.. Ibadan central Abatour Akinyele village. Stagnant water sampled in the morning has the highest load with 6.0 x10^{2} cfu/ml with 3.2x10^{2} cfu/ml. The meet in Akinyele has the highest range of staphylococci on samples collected in the evening with 4.7x10^{2} cfu/ml compare to 4.0x10^{2} cfu/ml for morning and 4.5x10^{2}cfu/ml for afternoon while the blood has the highest in the morning and lowest in the afternoon as shown on the table. The abattoir at Akinyele Local Government Moniya, has the highest microbial load of staphylococci in water sample collected in the evening with 4.5x10^{2} cfu/ml and lowest in blood with 2.7x10^{2} cfu/ml. Meat has highest load from afternoon sample (4.1x10^{2}) and lowest in morning sample (3.0x10^{2} cfu/ml). The highest staphylococci load of sample from Ibadan North Local Government Areas in water with 4.0x10^{2} cfu/ml and the least also from stagnated water collected in the evening. This is because of hygiene, neatened and washing of dirty stagnated meat in the meat in the evening has 4.3x10^{2} cfu/ml and lowest is 3.2 x10^{2}cfu/ml. The staphylococci load was highest in water with 5.0x10^{2} cfu/ml from Ibadan North East Local Government Areas and lowest in the meat. Afternoon blood samples have count of 4.0x10^{2} cfu/ml. Ibadan North east Local Government Areas has the highest Staphylococci load in water with 3.8x10^{2}cfu/ml for both morning and afternoon sample. The staphylococci population of fresh meat, blood and stagnat water at Ibadan South West Local Government Area Table has the highest load of 3.6x10^{2}cfu/ml from water collected in the morning, with the lowest at 2.3x10^{2} cfu/ml in evening meat samples. Ibadan South East Local Government has highest load of staphylococci water with 4.1 x10^{2} cfu/ml and lowest in meat with 1.3x10^{2} cfu/ml. water has shown to be source of contaminant in sample collected represents staphylococci count of sample from Ido Local Government Area with the highest court in water (4.0x10^{2} cfu/ml) and lowest in meat sample collected in evening with 2.0x10^{2} cfu/ml. represent the result of sample collected at Oluyole Local Government Area slaughtering house. The highest count of staphylococci is water sample collected in the evening with 4.5x10^{2} cfu/ml and lowest in fresh meat sample with 1.8x10^{2} cfu/ml. Ona-ara Local Government Area has high staphylococci count 06 6/0 x10^{2} cfu/ml water sample in the morning and the lowest in blood with 3.2x10^{2} cfu/ml. The staphylococci count of sample from Egbeda Local Government was highest in water and lowest in the afternoon (3.2x10^{2}cfu/ml) and lowest with 2.2x10^{2} cfu/ml for blood samples both morning and evening.

Fresh meat, stagnant water and blood samples from Lagelu Local Governmetn Areas have the highest staphylococci count of 4.0x10^{2} cfu/ml in water sample collected in the evening and lowest (2.0x10^{2} cfu/ml) in fresh meat.

IV. Discussion
The differences between microbial load from water in morning and evening sampling are the stagnated condition of the water samples and optimum range of temperature, which allows increase in growth of bacteria.

Modern science and technology have achieved success in drug discovery development. Not with standing, microorganisms in alarming frequency still create resistant pattern to some of the available modern medicines. Chikere et al. (2008), in a study have reported that the extensive use of broad-spectrum antibiotics has led to the wide spread occurrence of nosocomial infections by multi drug resistant microorganisms. To this extent, the high numbers of *S. aureus* isolated from patients and their resistance structure to majority of the employed modern drugs ascertained that urgent attention is needed to save the world from multi drug resistant microbes by finding alternative effective measures for their eradication. Despite this, the ineffectiveness of some modern medicines are not discriminated as faced on traditional folklores The continuous use of these ineffective antibiotics however, may favour the emergence of resistant strains of hospital and community acquired pathogens. Findings in this study, shows that 60% of female and only 40% of males patients had nasal infection caused by *S. aureus* infected.

Hence the sampled waters is more populated in microbial counts among the samples and it is used in the washing of meat in abattoirs, the high population of staphylococci infection in meat and effluent from abattoirs could be deduced to water contamination. Polluted or contaminated water has been reported to be a vehicle for epidemics or pandemics (WHO 1979).

Table 1: Staphylococci counts from patients attending health centres

	Samples	
Sampling area	urine	faeces
Ibadan North	1.27×10^2	1.67×10^2
Ibadan North East	1.11×10^2	1.9×10^2
Ibadan North West	1.07×10^2	1.4×10^2
Ibadan South East	1.13×10^2	1.43×10^2
Ibadan South West	8.67×10^2	1.47×10^2
Ido	1.7×10^2	2.07×10^2
Lagelu	1.57×10^2	1.93×10^2
Oluyele	1.07×10^2	1.47×10^2
Ona ara	1.2×10^2	1.0×10^2
Egbeda	1.47×10^2	2.53×10^2

Table 2: Staphylococci counts in meat, blood and water from abattoir

	Morning			afternoon			evening		
	Meat	blood	water	Meat	blood	water	Meat	Blood	water
Ibadan central abattoir	4.0×10^2	3.8×10^2	6.0×10^2	4.5×10^2	3.2×10^2	5.4×10^2	4.7×10^2	3.4×10^2	5.5×10
Akinyele	3.0×10^2	2.7×10^2	3.1×10^2	4.1×10^2	3.2×10^2	4.2×10^2	3.7×10^2	3.2×10^2	4.5×10^2
Ibadan North	3.2×10^2	2.6×10^2	4.0×10^2	3.7×10^2	2.3×10^2	3.8×10^2	4.3×10^2	2.5×10^2	1.6×10^2
Ibadan North East	4.0×10^2	3.8×10^2	4.2×10^2	3.2×10^2	4.0×10^2	5.0×10^2	1.8×10^2	2.2×10^2	3.0×10^2
Ibadan North West	3.0×10^2	3.5×10^2	3.8×10^2	2.6×10^2	3.6×10^2	3.8×10^2	1.8×10^2	2.3×10^2	1.6×10^2
Ibadan South West	3.3×10^2	3.4×10^2	3.6×10^2	3.5×10^2	3.5×10^2	3.3×10^2	2.3×10^2	3.2×10^2	3.1×10^2
Ibadan South East	1.6×10^2	1.9×10^2	4.0×10^2	1.3×10^2	2.3×10^2	4.1×10^2	1.8×10^2	2.1×10^2	2.9×10^2
Ido	3.0×10^2	4.2×10^2	1.9×10^2	2.3×10^2	4.0×10^2	1.8×10^2	1.9×10^2	3.2×10^2	2.0×10^2
Lagelu	3.2×10^2	3.0×10^2	3.5×10^2	2.5×10^2	3.2×10^2	3.7×10^2	2.0×10^2	2.8×10^2	4.0×10^2
Oluyele	2.8×10^2	3.8×10^2	4.2×10^2	2.5×10^2	3.2×10^2	4.3×10^2	1.8×10^2	2.9×10^2	4.3×10^2
Ona Ara	4.0×10^2	3.8×10^2	6.0×10^2	4.5×10^2	3.2×10^2	5.4×10^2	4.7×10^2	3.4×10^2	5.5×10^2
Egbeda	3.1×10^2	2.2×10^2	3.0×10^2	2.7×10^2	2.3×10^2	3.2×10^2	3.3×10^2	2.2×10^2	1.4×10^2

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