Epidemiological and Clinical Profile of Work-Related Dermatoses in the Artisanal Fishing Ports of Conakry, Guinea: Cross-Sectional Study.

SUMMARY

Introduction: artisanal fishing is a widely practiced activity in third world countries, predisposing workers in this field to work accidents and occupational diseases. The objective was to describe the epidemiological and clinical profile of dermatoses in workers in artisanal fishing ports in Conakry.

Materials and Methods: the study was cross-sectional and descriptive in nature, lasting 17 months. Workers with active or remitting dermatosis were included. A multidisciplinary medical observation (occupational physicians and dermatologists) was made of each worker.

Results: the study focused on 396 workers in artisanal fishing ports who had dermatosis in artisanal fishing ports in Conakry with an average age of 39 years and a male predominance of 72.5%. Fishermen represented the most affected professionals with 65.6%. Erythema and keratosis were the dominant dermatological lesions, 45.9% and 35.3% respectively. Traumatic dermatoses were encountered in 90.9% with an involvement of the hands of 70.7% and the feet of 26.5%. Among the etiologies identified on the lesions, the bite of the jaw dominated with 51.9%. Almost all (99%) of the workers of the artisanal fishing ports had no qualified professional training in the matter against 44.9% who used gloves and 16.2%, helmets.

Conclusion: dermatoses in the artisanal port environment are urgent as a significant health problem among workers. The establishment of a research orientation plan focused on working conditions and medical surveillance will allow a better understanding of safety and health issues in this area.

Keywords *: Dermatoses, Workers, Artisanal fishing, Guinea.*

1. INTRODUCTION

Occupational dermatoses are skin lesions whose cause may result in whole or in part from the conditions in which the work is carried out. They constitute a problem frequently encountered by the dermatologist or the occupational physician and represent 10% of skin pathology and 40% of occupational diseases [1] . They are often caused by contact with specific agents present in the workplace [2] .
injuries are caused by seafood, fishing gear, chemical additives [3] . They can be formed after exposure by infections (bacterial or fungal) and injuries caused by aquatic plants. Many marine and aquatic invertebrates are associated with different types of dermatological lesions that can vary from irritant or allergic contact dermatitis to physical trauma and infections [4] . In the United States, Burke WA et al. observed a prevalence rate of 37% of eczema and 30% of fungal infections in fishermen [5] . In Spain, Novalbos J et al. reported 54% of sun-related skin lesions in fishermen [6] . In India, Harshani SRAP et al. found a prevalence of 24% of skin diseases in fishermen [7] . In Kenya, Ngaruiya FW et al. revealed a 100% prevalence of skin burns and cuts among women fish processors [8] . In Morocco, Laraqui O et al. revealed an 82.5% prevalence of skin diseases among artisanal fishermen [9] . In Guinea, no reported data on occupational dermatoses in the fishing industry were found.
Guinea is a coastal country on the Atlantic Ocean where activities related to fishery products are widely practiced by artisanal and industrial fishing. In artisanal fishing, from capture to marketing through processing and seafood products, several professional groups intervene in working conditions that may be likely to lead to work accidents and occupational diseases. The specific objectives were to determine the prevalence of dermatoses related to work in artisanal fishing ports, describe the main dermatoses encountered and identify existing preventive measures among workers.

2. MATERIALS AND METHODS

The 18 artisanal fishing ports of Conakry registered in the portfolio of the national department in charge of fisheries served as a framework for the realization of this study. They are used for the landing of seafood caught during fishing, for the processing of seafood (smoking of fish, freezing) and their marketing, for the assembly of fishing nets, for the construction and maintenance of pirogues.
This was a seventeen-month (September 2020 to January 2022) descriptive cross-sectional study.
Workers with active or remitting work-related dermatosis who agreed to participate in the study and who were working at one of the ports at the time of the survey were included. All workers who had a dermatosis unrelated to their work were excluded.
Our sample size (n) was determined using Schwartz's formula $\mathbf{n=z^2 * p * (1-p)/d^2}$ which gave384.16 ~ 400 **(** the constant (**z**) is 1.96, the prevalence of dermatoses in the population was estimated at 50% with a degree of precision of 95% and a margin of error **d** of 5%); i.e. a total of 400 workers distributed between these 18 clusters.
The variables consisted of socio-professional information, clinical elements, the impact of dermatoses on work and existing preventive measures among workers.
A mixed team of occupational health specialists and dermatologists was mobilized in each artisanal port to examine the participants in compliance with professional confidentiality after their free consent. The iconographies were produced using a smartphone for certain sensitive dermatoses.
Data analysis was performed using Epi info version 7.2. Results were expressed as percentage, mean, standard deviation and iconographies in the appendix 1.

3. RESULTS

3.1 Description of the study population

The study population consisted of 400 workers, 396 (99%) of whom had work-related skin diseases, unlike 04 (1%) other workers who had skin conditions unrelated to work.
Work-related dermatoses were distinguished from those related to work by factors of occurrence related to working conditions.

3.2 Socio-professional profile

The population was strongly represented by male sex workers with a ratio of 2.6 to 1 woman, the average age is 39 ± 12 years with extremes of 17 and 76 years. Illiterate people were victims in 46% against 19.2% of them who had a primary education level. Fishermen and smokers dominated among the professionals most affected by dermatoses with respectively 65.6% and 19.7%. The average seniority is 17 ± 11 years with extremes of 1 and 54 years (*Table I*).

3.3 Clinical parameters

The basic lesions were marked by erythema and keratosis with 45.9% and 35.3% respectively. Pain and swelling were associated with dermatoses successively in 90.7% and 69.5% of workers (*Table II*). Four (4) types of traumatic (90.9%), infectious (39.1%), allergic (11.6%) and actinic (0.2%) dermatoses were encountered (*Table III*). Fish were the main etiologies with 45.2% followed by fillets with 29.5%. As for the occurrence, 46.7% and 26.5% were respectively caused by sting and friction (*Table IV*). Some infectious sources were determined in 155 people including bacterial (66.4%), mycotic (29.7%), viral (1.9%) and parasitic (0.6%).

3.4 Impacts of dermatoses on work

Unavailability at workstations was reported by 383.8% (134/396) with an average unavailability duration of 3 weeks ± 4 days. Among them, 47.8% spent 4 to 24 weeks without carrying out daily professional activities.

3.5 Medical and technical prevention

3.5.1 Regulatory visits

No worker, regardless of their professional level, had benefited from a regulatory medical examination (hiring, annual or return to work).

3.5.2 Collective and individual measures

Among workers with dermatoses, 99% (392/396) did not receive education, information and communication on the risks of dermatoses in the port environment. As for personal protective equipment among victims of dermatoses, 53.3% (211/396) of them had no preventive means.

Table I: Distribution of workers with dermatoses according to socio-professional profile in the artisanal fishing ports of Conakry.

Socio-professional profile	Workforce (n=396)	Percentage (%)
Sex		
Male	287	72.5
Female	109	27.5
Age (years)		
≤ 19	13	3.3
20-29	64	16.2
30-39	131	33.0
40-49	100	25.3
50-59	56	14.2
≥60	32	8.0
Level of education		
Illiterate	182	46.0
Primary	76	19.2
Secondary	130	32.8
Superior	8	2.0
Marital status		
Married	274	69.2
Bachelor	102	25.8
Widower	12	3.0
Divorced	8	2.0
Occupation		
Fisherman	260	65.6
Fish smoker	78	19.7
Saleswoman	27	6.8
Scaler	13	3.3
Fishmonger	8	2.0
Unloader	5	1.3
Cold Storage Warehouse Worker	2	0.5
Other*	3	0.8
Length of service in the job (year)		
< 1	3	0.8
1-10	140	35.3
11-20	138	34.9
> 20	115	29.0

***:** *mechanic, union member, carpenter.*

Table II: Distribution of workers with dermatoses according to symptoms in the artisanal fishing ports of Conakry.

Symptoms	Staff (n)	Percentage (%)
Basic lesions	***(n=396)***	***(%)***
Erythema	182	45.9
Keratosis	140	35.3
Crack	123	31.0
Ulceration	117	29.5
Scales	48	12.1
Papules	29	7.3
Pustule	29	7.3
Macules	28	7.1
Vesicle	15	3.8
Blisters	14	3.5
Crusts	12	3.0
Excoriations	8	2.0
Growths	2	0.5
Scar	2	0.5
Necrosis	2	0.5
Tuber	1	0.2
Cracks	1	0.2
Associated signs	***(n=236)***	***(%)***
Pain	214	90.7
Swelling	164	69.5
Bleeding	159	67.4
Fever	60	25.4
Edema	56	23.7
Pruritus/itching	48	20.3
Hematoma	1	0.4
Pain	214	90.7
Swelling	164	69.5
Bleeding	159	67.4
Fever	60	25.4
Edema	56	23.7
Pruritus/itching	48	20.3
Hematoma	1	0.4

Table III :Prevalence of dermatoses among workers in artisanal fishing ports in Conakry.

Type of dermatoses	Dermatoses	Workforce (n=396)	Percentage (%)
Traumatic dermatoses	Injuries (minor +)	222	56.1
	Palmar hyperkeratosis	112	28.3
	Burn	14	3.5
	Plantar hyperkeratosis	10	2.5
	Keloid scar after burn	02	0.5
	Total	***360***	***90.9***
Infectious dermatoses	Skin superinfections	78	19.7
	Onychomycosis	30	7.6
	Paronychia	11	2.8
	Whitlow	7	1.8
	Intertrigo	7	1.8
	Pityriasis versicolor	7	1.8
	Erysipelas (simple, abscess)	6	1.5
	Skin warts	3	0.8
	Itching	2	0.5
	Gangrene	1	0.2
	Boil	1	0.2
	Furunculoid myiasis	1	0.2
	Cutaneous and plantar mycosis	1	0.2
	Total	***155***	***39.1***
Allergic/irritative dermatoses	Contact dermatitis	36	9.1
	Contact eczema	7	1.8
	Nail dystrophy	3	0.8
	Total	***46***	***11.6***
Actinic dermatoses	Actinic dermatitis	1	0.2

Table IV: description of the causes, species and mode of occurrence of dermatoses in the artisanal fishing ports of Conakry.

Elements	Staff (n)	Percentage (%)
Causes	***(n=396)***	***(%)***
Pisces	179	45.2
Net	117	29.5
Sea water	37	9.3
Crabs	5	1.3
Hook	3	0.7
Shrimp	2	0.5
Docking iron, smoking, tips)	26	6.6
Others *	109	27.5
Fish species	***(n=179)***	***(%)***
Jawbone	93	51.9
Ray	18	10.0
Otholite	15	8.4
Ethmalosis	12	6.7
Belt	7	3.9
Sparid	7	3.9
Red carp	5	2.8
Mule	4	2.2
Sea bream	3	1.7
Barracuda	2	1.1
Growler	2	1.1
Captain	1	0.5
Pay	1	0.5
Undetermined species	9	4.9
Mode of occurrence	***(n=396)***	***(%)***
Sting	185	46.7
Friction	105	26.5
Contact	101	25.5
Cut	42	10.6
Burn	20	5.0
Bite	7	1.8
Others (shock, exposure to sun, slipping)	37	9.3
Cut	42	10.6
Burn	20	5.0
Bite	7	1.8
Others (shock, exposure to sun, slipping)	37	9.3

**: boots, wet gloves, jellyfish, paederus, shell, mud, fire, longline rope, bottle, sea torture, engine, canoe, lead, sun, rock, sea wind.*

Iconographic results of dermatoses among workers in the artisanal fishing ports of Conakry.

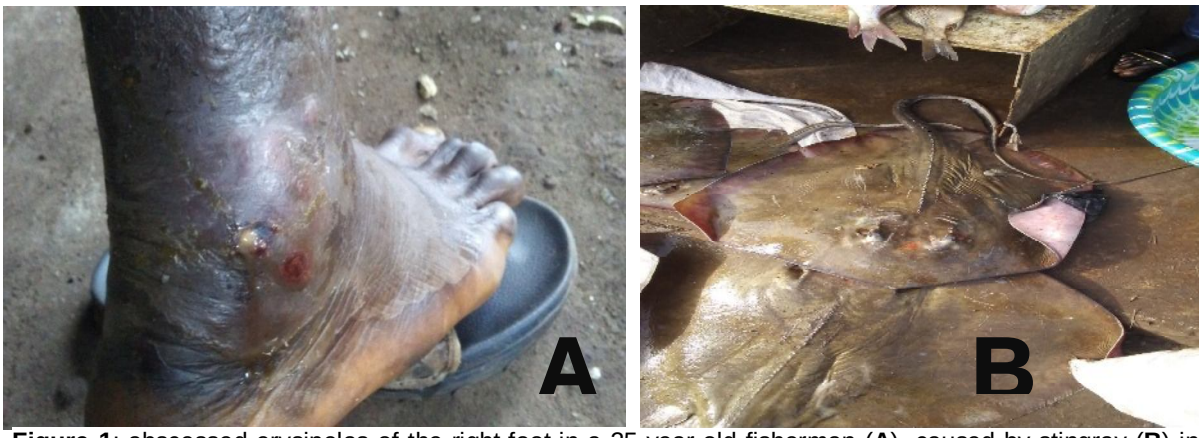

Figure 1: abscessed erysipelas of the right foot in a 25-year-old fisherman (**A**), caused by stingray (**B**) in an artisanal fishing port in Conakry

Figure 2:gangrene of the right index finger (**C**) in a 45-year-old fisherman, caused by a bite from a stingray (**D**) in an artisanal fishing port in Conakry.

Figure3:Lichnenic eczema of the left foot in contact with boots in a 45-year-old fisherman (**E**) and pityriasis versicolor on the back in a 40-year-old fisherman in permanent contact with mud (**F**) in the artisanal fishing ports of Conakry.

4. DISCUSSION

The country does not have a table of occupational diseases to consider these dermatoses as occupational diseases from the outset while artisanal fishing is an informal sector and provides employment in the country for a context where no preventive measure is envisaged for the protection of the safety and health of workers.

The lack of microbiological examinations and epicutaneous tests were the limitations of this study. However, the results obtained allowed us to assess the epidemic and clinical profiles of dermatoses in the artisanal fishing ports of Conakry and they cannot be extrapolated without observing precautions. However, these limitations will be minimized by the type of study (descriptive study).

The prevalence of this study is 99% (396/400) of dermatoses in artisanal fishing ports. Trend found by Laraqui O et al. in Morocco [9] was a prevalence of 100% of skin diseases among fishermen. Activities related to the primary sector such as artisanal fishing are often practiced in inappropriate working conditions.

The age group of 30 to 39 years was the most observed with 33%. Percin F et al. in Turkey [10] had also found 74% for this same age group. The male sex was dominant with the sex ratio of 2.6 in favor of men. This result relates to the study of Filho FB et al. in Brazil [3] and that of Harshani SRAP et al. in India [7]who respectively found a sex ratio of 18.4 and all fishermen were male. This age range and male predominance would be reflected in the demands of tasks, constraints and roles of workers in maintaining the pace of artisanal fishing activities.

Regarding the level of education, other studies such as Xandri Royo P et al. [11] in Senegal and Kolawole OD et al. [12] inBotswana have regained the representation of non-schooled fishermen respectively 56.8% and 50%. The informal nature of the sector associated with the lack of requirement on the competence in the activities of artisanal ports could constitute the main obstacles to the promotion of hygiene and safety measures in this area.

The most exposed occupational group concerned fishermen, this result is similar to that of Novalbos J et al. [6] in Spain with 54% of skin lesions in the same occupation. This result could be explained by the fact that fishermen are essential in the process of operating an artisanal port through production (capture) which can generate risks of work accidents.

The work seniority between 1 and 10 years was predominant with 35.3%. In contrast to a study conducted in Brazil, Silva BKR et al. [13] in 2019 reported 53.5% of the work seniority was less than 10 years. This result is consistent with the high representation of the relatively young stratum in artisanal fishing ports, which could also explain their low level of professional experience in the prevention of certain exposures.

The most observed elementary dermatological lesion was erythema (45.9%), accompanied by pain (90.7%) of cases. Compared to Bernardes Filho F et al. [3]In Brazil in 2019, erythema constituted 42.1% of elementary lesions accompanied by pain with 99%.Traumatic dermatoses (90.9%) were marked by injuries and palmar hyperkeratosis with 56.1% and 28.3% respectively followed by infectious dermatoses with 39.1%. Our results are comparable to those of Laraqui O et al. [9] in Morocco in 2018, who reported 52.2% of traumatic injuries, 67.1% of palmar hyperkeratosis and 44.4% of fungal infections. Microtraumas caused by fish bites or other aquatic species or by service equipment can constitute entry points for germs responsible for infections.

Fish were the main cause of skin diseases in artisanal fishing ports (45.2%), among which catfish was incriminated in 51.9%. Bernardes Filho F et al. [3] reported that 65% of work accidents among fishermen were caused by catfish (or catfish) with the scientific name *Genidensgenidens* . The jawbone has spines, which, if handled unexpectedly, could result in stinging and poisoning with toxins [14] which could be responsible for inflammation and the risk of skin necrosis.

The mode of occurrence of occupational dermatoses was dominated by bites (46.7%). Other studies have mentioned the same mode of occurrence among artisanal fishermen such as in Botswana Kolawole OD et al. [12] 36.3% fish bites and in Iraq Al-Hamdi K et al. [15] 20.9% marine bites.

Only 1% of workers received training on occupational risk prevention compared to 99% who had received no basic training in this area. In Bangladesh, Al Noman MA et al. [16]reported a rate of 3% of fishermen trained on the prevention of occupational risks. More than 53.3% (211/396) of workers suffering from dermatosis had no personal protective equipment (PPE). Ngaruiya FW et al. [8] and El-Saadawy M et al.[17]reported that % and 55.6% of fishermen wore PPE respectively. The informal nature of the sector could be a hindrance to the promotion of hygiene and safety at work due to the non-application of the Wise method and the lack of interest of social welfare organizations in the field of safety and health at work. As reported by Xandri Royo P et al. [11]in Senegal,that artisanal fishermen working in the informal sector did not benefit from social security coverage.

CONCLUSION

This study shows that dermatoses remain a significant medical problem in the artisanal fishing ports of Conakry and spare no professional stratum with a predominance among young workers. Fish were the fishery product mainly incriminated in the dermatoses determined in the artisanal fishing ports of Conakry. The low level of prevention of occupational risks among workers remains a determining factor in artisanal fishing ports. However, the lack of training on risk prevention, PPE, poor working conditions and the absence of regulatory texts are among the factors predisposing to the occurrence of dermatoses.

The implementation of a local surveillance plan would allow for a better understanding of health and safety issues and more particularly of dermatoses in artisanal port environments. Thus, research orientations focused on working conditions would allow for a better understanding of this phenomenon.

CONSENT

Authorization for the conduct of this study and the identification of sites was obtained from the authorities in charge of the management of maritime artisanal fishing ports, followed by the adhesion of the union leaders of each port to facilitate the participation of workers from all professional levels. A clinical examination was carried out for each participant in compliance with professional confidentiality after their free consent.

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