

Prevalence of skin diseases amongst Moroccan fishermen

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ABSTRACT

Background: The main objective was to evaluate the prevalence of skin diseases amongst fishermen, to specify the different clinical forms, associations and most frequent localisations, and to identify potential aetiological factors. The secondary objectives were to assess the knowledge, attitudes and practices of seafarers regarding occupational dermatoses to conduct information, awareness and education campaigns on risk factors and behaviours and to propose adapted prevention.

Materials and methods: This cross-sectional survey involved 1102 artisanal fishermen who attended the annual legal medical consultation at the occupational health service. All participants were men and had a regular activity for at least 2 years. It included an individual questionnaire, a clinical examination and a technical visit to the workplace

Results: The skin disorders were palmar hyperkeratosis in 67.1% of fishermen, plantar hyperkeratosis in 59.4%, scares in 52.2%, facial wrinkling in 32%, and marine stings in 11.2%. The skin infections were fungal (44.4%), bacterial (8.3%), viral (5.5%) and scabies (1%). Only 192 (17.4%) fishermen did not have any dermatologic disease, 43% had one type of dermatologic diseases, 27.2% two types, 9.5% three types and 2.5% four types. Concerning personal protective equipment, only 87.4% wore protective clothing, 12.8% high visibility clothing, 52.6% safety shoes, 30.1% protective gloves, and 63.5% protective caps or hats. Only, 12% knew that mycosis were infectious origin and were contagious. Eighty-two per cent ignored the mode of contamination, 78% the means of prevention and 91% the existence of a medical treatment. Ninety-five per cent thought that pityriasis versicolor was due to sunrays especially in summer and not to fungus.

Conclusions: The elaboration of the prevention approach needs a cooperative spirit; it will be more accepted and applied by all fishermen, if their representatives are involved in its preparation. The realisation of information and sensitization campaigns about the skin health must be based on the results of prevalence surveys.

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Key words: skin diseases, fishermen, Morocco

INTRODUCTION

Artisanal fishermen are at risk for skin diseases because they live and work in conditions that are often harmful to their skin health. Environmental risk factors (seawater, salt, spray, wind, humidity, sun radiations, sand, etc.) daily attacked their derma. Marine creatures, sea products, and

equipment used in the marine work (contending and sharp tools, etc.) may be hazardous to their skin. Hyperkeratosis, contact dermatitis, traumatic injuries and stings can be a portal of entry for various infectious agents. Frequent and prolonged sun radiations associated with continuous wetness are potential hazards [1].

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In developed countries, skin diseases amongst fishermen have been known and studied since long time. Several meetings and conferences on maritime dermatology, skin diseases and occupational dermatology were organized [2, 3]. Skin disorders were a very common occupational hazard with reported rates ranging from 4.3–8.2 cases per 10,000 full time workers in all occupations in the United States of America from 1992–2001 [4]. Occupational skin diseases are among the top three registered occupational diseases in Europe [5, 6]. In France, dermatological pathology is important and accounts for 40% of health problems among seafarers [7], more than 10% of all general skin diseases and one third of all occupational diseases [8–10]. However, sailors neglected skins diseases. In a review over 5 years of the specialised consultation activity for occupational dermatology at the University Hospital Centre of Brest (France) no mariner had consulted. This underlines the insufficient management of these diseases [7]. Educational actions to promote the skin health of fishermen were conducted in several countries [11]. In our country, fishing is one of the most important economic activities but there are no studies on the skin health of fishermen. Numerous acute injuries and chronic dermatological diseases are often unnoticed and underestimated by fishermen who can easily cope with it. The majority of dermatoses are not considered pathological by seafarers and are often not grounds for medical consultation. Despite their high frequency, the dermatological pathologies of seafarers suffer from under-reporting and lack of interest. However, very few investigations were led on this subject in developing countries [12].

The main objective of this study was to evaluate the prevalence of skin diseases amongst fishermen, to specify the different clinical forms, associations and most frequent localizations, and to identify potential aetiological factors. The secondary objectives were to assess the knowledge, attitudes and practices of seafarers regarding occupational dermatoses to conduct information, awareness and education campaigns on risk factors and behaviours and to propose appropriate prevention.

MATERIALS AND METHODS

FRAMEWORK AND TYPE OF STUDY

This cross-sectional, observational and epidemiological study was conducted from January to September 2017 at the port of Tangier in northern Morocco.

TARGET POPULATION

The survey involved 1102 artisanal fishermen who attended the annual legal medical consultation at the occupational health service. All participants were men and had a regular activity for at least 2 years.

TECHNIQUES AND TOOLS FOR DATA COLLECTION

The study included an individual questionnaire, a clinical examination by an occupational physician and a dermatologist and a technical visit to the workplace (working conditions and hygiene on board and at the dock). The questionnaire, inspired by the Nordic Occupational Skin Questionnaire [13], consisted of 50 items divided into three rubrics:

- Socio-demographic and occupational characteristics;
- Dermatological disorders and diseases (types, localisations, associations). The direct causes of occupational dermatoses are mechanical, physical, biological, chemical and sea creatures;
- Knowledge, attitudes and practices related to skin diseases and their prevention.

ETHICAL AND DEONTOLOGICAL ASPECTS

We previously contacted the Ministry of Fisheries delegate, the presidents of the associations of fishermen and the occupational physician to explain the purpose of the study and to obtain their support and their cooperation. The medical consultations (interviews and clinical examinations) took place within the occupational health service of fishermen. The singular colloquium with each fisherman was carried out in confidentiality after informing him of the interest of our study. The questions were formulated orally, if necessary translated in Arabic dialect. The medical visit lasted approximately 20 min for each person. The fishermen answered the questionnaire without difficulty and with enthusiasm.

RESULTS

SOCIODEMOGRAPHIC AND PROFESSIONAL CHARACTERISTICS

The Table 1 shows sociodemographic and professional characteristics. The average age was 39.1 ± 10.4 years and the average length of employment was 20.1 ± 5.3 years.

PREVALENCE DERMATOLOGIC DISEASES

A distribution of the types of skin diseases encountered is displayed in Table 2. The traumatic skin disorders were the most frequent, with palmar hyperkeratosis found in 67.1% of fishermen, plantar hyperkeratosis in 59.4%, scares of cuts, injuries, wounds (by instruments, fish spines, etc.) in 52.2%, facial wrinkling in 32%, and marine creature stings in 11.2%.

The skin infections were fungal (44.4%), bacterial (8.3%), viral (5.5%) and scabies (1%). The mycosis included: onychomycosis in 21.3% (in 18% it involved nails of toes and in 3.3% – nails of fingers), pityriasis versicolor in 7.3%, toe web fungal infections in 11.7%, mycosis of large folds

Table 1. Sociodemographic and professional characteristics

Parameters	N = 1102
Age [years]:	
≤ 40	484 (43.9%)
> 40	709 (64.3%)
Marital status:	
Live in couple	855 (77.6%)
Live alone	247 (22.4%)
Number of people living home:	
≤ 4	399 (36.2%)
> 4	703 (63.8%)
Level education:	
Illiterate	225 (20.4%)
Primary	587 (53.3%)
Secondary	165 (15%)
College/university	7 (0.6%)
Place of residence:	
Urban	1031 (93.6%)
Rural	71 (6.4%)
Toxic habits:	
Alcohol	327 (29.7%)
Tobacco	483 (43.8%)
Cannabis	364 (33%)
Other psychotropic substances	33 (7.8%)
Socio-professional categories:	
Pilots/co-pilots	212 (19.2%)
Mechanics on board	72 (6.5%)
Fishermen	818 (74.2%)
Length of employment [years]:	
2–10	99 (9%)
11–20	747 (67.8%)
> 20	526 (47.7%)
Daily working [hours]:	
< 8	53 (4.8%)
8–12	936 (84.9%)
> 12	113 (10.3%)

or smooth skin in 3.4%, and tinea in 0.6%. The bacterial infections were acute disorders: boils, pulp space infections, nail fold infections, and pyoderma. The viral infections were skin warts (4.2%) and herpetic button (1.3%). The parasitic infections (scabies) were 1%.

PREVALENCE OF DERMATOSES AND THE MOST FREQUENT ASSOCIATIONS

Only 192 (17.4%) fishermen did not have any dermatologic disease, 43% had one type of dermatologic diseases, 27.2% two types, 9.5% three types and 2.5% four types. Among bi-associations the most frequent was hyperkeratosis + mycosis (10.9%). For tri-associations the most frequent was hyperkeratosis + mycoses + scares from injuries (3.1%) (Table 3.)

PREVALENCE OF MYCOSIS AND THEIR ASSOCIATIONS

Among fishermen 40.8% had mycosis: 37.8% one type of mycosis, 2.5% two types and 0.5% three types. The most

Table 2. Prevalence dermatologic diseases

Dermatologic diseases	Total population (n = 1102)
Physical and traumatic agents:	
Palmar hyperkeratosis	739 (67.1%)
Plantar hyperkeratosis	655 (59.4%)
Scares from cuts, injuries, wounds	575 (52.2%)
Facial wrinkling	353 (32%)
Marine creature stings	123 (11.2%)
Biological or infectious agents:	
Fungal infections (mycosis):	489 (44.4%)
Onychomycosis	235 (21.3%)
Pityriasis versicolor	80 (7.3%)
Toe web fungal infections	129 (11.7%)
Mycosis of smooth skin and large folds	43 (3.9%)
Tinea	9 (0.8%)
Bacterial infections	91 (8.3%)
Viral infections	60 (5.5%)
Skin warts	46 (4.2%)
Herpetic button	14 (1.3%)
Parasitic infections (scabies)	11 (1%)
Others causes:	
Sunburn	131 (11.9%)
Contact dermatitis	102 (9.3%)
Pruritus	76 (6.9%)
Miliaria	145 (13.2%)
Seborrheic dermatitis	45 (4.1%)
Acne	13 (1.2%)
Vitiligo	4 (0.4%)
Psoriasis	6 (0.6%)

frequent associations was onychomycosis + toe web fungal infections (1.2%) (Table 4).

KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO SKIN DISEASES AND THEIR PREVENTION

Concerning personal protective equipment, only 87.4% wore protective clothing, 12.8% high visibility clothing, 52.6% safety shoes, 30.1% protective gloves, and 63.5% protective caps or hats. Furthermore, 98% reported that they never used sunscreen or photoprotective clothes. Seventy-nine per cent were unaware that sunrays were harmful to the skin and could induce skin cancer.

Knowledge of aetiologies, modes of contamination, prevention and treatment of mycoses were shown in Table 5. Only 12% knew that mycosis were infectious origin and were contagious. Eighty-two per cent ignored the mode of contamination, 78% the means of prevention and 91% the existence of a medical treatment. Ninety-five per cent thought that pityriasis versicolor was due to sunrays especially in summer and not to fungus. Traditional methods, without scientific evidence of efficacy, were used as ancillary measures to manage several hazards at work. These were considered, however, to be either inadequate and/or unsafe offering potential risk for fishermen's health.

Table 3. Prevalence of dermatoses and the most frequent associations

Parameters		Value
Non dermatosis		192 (17.4%)
1 type of dermatoses n = 474 (43%)	Hyperkeratosis	208 (18.9%)
	Mycosis	170 (15.4%)
	Contact dermatitis	24 (2.2%)
	Sunburn	15 (1.4%)
	Injuries and wounds	12 (1.1%)
	Bacterial infections	12 (1.1%)
	Pruritus	10 (0.9%)
	Acne	9 (0.8%)
	Scabies	5 (0.5%)
	Vitiligo	3 (0.3%)
	Herpetic button	3 (0.3%)
	Psoriasis	2 (0.2%)
	Skin wart	1 (0.1%)
2 types of dermatoses n = 304 (27.6%)	Hyperkeratosis + mycosis	120 (10.9%)
	Hyperkeratosis + injuries (wounds)	56 (5.1%)
	Hyperkeratosis + contact dermatitis	36 (3.3%)
	Hyperkeratosis + skin wart	19 (1.7%)
	Hyperkeratosis + bacterial infections	12 (1.1%)
	Others associations	61 (5.5%)
3 types of dermatoses n = 104 (9.5%)	Hyperkeratosis + mycoses + injuries	34 (3.1%)
	Hyperkeratosis + mycosis + bacterial infections	7 (0.6%)
	Hyperkeratosis + mycosis + sunburn	4 (0.4%)
	Hyperkeratosis + mycosis + skin wart	5 (0.5%)
	Mycosis + contact dermatitis + injuries	5 (0.5%)
	Others associations	49 (4.4%)
4 types of dermatoses n = 28 (2.5%)	Hyperkeratosis + injuries + mycosis + contact dermatitis	13 (1.2%)
	Hyperkeratosis + injuries + contact dermatitis + skin wart	4 (0.4%)
	Hyperkeratosis + injuries + mycosis + bacterial infections	2 (0.2%)
	Hyperkeratosis + injuries + mycosis + contact dermatitis	2 (0.2%)
	Hyperkeratosis + injuries + contact dermatitis + bacterial infections	4 (0.4%)
	Hyperkeratosis + injuries + mycosis + pruritus	2 (0.2%)
	Hyperkeratosis + injuries + bacterial infections + scabies	1 (0.1%)
	Hyperkeratosis + injuries; contact dermatitis + pruritus	1 (0.1%)
	Hyperkeratosis + injuries + mycosis + sunburn	1 (0.1%)
	Hyperkeratosis + mycosis + contact dermatitis + bacterial infections	1 (0.1%)

Table 4. Prevalence of mycosis and their associations

Mycosis and their association		Value
1 type de mycosis n = 417 (37.8%)	Onychomycosis	201 (18.2%)
	Toe web fungal infections	111 (10.1%)
	Mycosis of large folds	28 (2.5%)
	Pityriasis versicolor	72 (6.5%)
	Tineas	5 (0.5%)
2 types de mycoses n = 27 (2.5%)	Onychomycosis + toe web fungal infections	13 (1.2%)
	Onychomycosis + mycosis of large folds	8 (0.7%)
	Onychomycosis + pityriasis versicolor	6 (0.5%)
3 types de mycoses n = 6 (0.5%)	Onychomycosis + toe web fungal infections + mycosis of large folds	2 (0.2%)
	Onychomycosis + toe web fungal infections + pityriasis versicolor	2 (0.2%)
	Onychomycosis toe web fungal infections + tineas	2 (0.2%)

DISCUSSION

Traumatic and mechanic disorders were the most frequent in our study: palmar hyperkeratosis (67.1%), planar hyperkeratosis (59.4%) and scares from cuts, injuries,

wounds (27%). Similar high frequency was found in Iraq: 56.5% for palmar hyperkeratosis [12]. Fishermen are especially prone to hyperkeratosis because they are group of people, accustomed to difficult work for long hours. They

Table 5. Knowledge of aetiologies, modes of contamination, prevention and treatment of mycoses

Parameters	Value
Aetiologies:	
Hereditary	145 (13.2%)
Traumatic	187 (17%)
Sea water	133 (12.1%)
Sun	177 (16.1%)
Infectious	135 (12.3%)
Do not know	697 (63.2%)
Modes of contamination:	
Direct contact	167 (15.2%)
Contaminated linen	124 (11.3%)
Contaminated PPE	90 (8.2%)
Nail clipper	103 (9.3%)
Do not know	906 (82.2%)
Means and measures of prevention:	
Personal linen	167 (15.2%)
PPE	204 (18.5%)
Drying hands and feet after washing	56 (5.1%)
Do not know	864 (78.4%)
Treatment:	
Local	67 (6.1%)
General	79 (7.2%)
Do not know	1008 (91.5%)

PPE – personal protective equipment

carry heavy loads without adequate personal protective equipment. They are outdoor workers who are exposed to different hazards, which can be acquired from marine environment (intense prolonged sun exposure, extremes of temperature, humidity) [3]. There are many types of hyperkeratosis, which include corns and calluses developed in areas of skin exposed to repeated friction or pressure. In response, thick layers of dead skin cells pile up and harden. Corns usually develop on irritated toes. Calluses form on the soles of the feet and the palms of the hands. In our study, the high frequency of hyperkeratosis can be justified; only 52.6% and 30.1%, respectively wear safety shoes and protective gloves.

Fishermen are particularly exposed to infections of the hands and fingers because of their working environment and the things that they are required to handle during their work. For instance, fish spines and many other things may injure them. Minor cuts and grazes often go unnoticed at the time of injury. Bacteria are carried into these wounds from fish slime, from pieces of metal etc. Infection then develops with inflammation of the infected area and the formation of pus [5, 6]. In our study, 8.3% of fishermen had acute bacterial infections. Lucas et al. [3] reported the similar prevalence (10%) for all cases requiring tele-medical consultation for acute treatment among seafarers. Amongst fishermen in Iraq 15.2% had bacterial infections [12].

In our survey, the frequency of fungal infections was 44.4%, and 40.8% of fishermen had fungal infections. In

Iraq, the same prevalence was found 34.3%. Among the runners, included during the 2012 AG2R transatlantic race in April 2012, 95% presented dermatoses. The most common were fungal infections, folliculitis, diaper rash and desquamation of the hands [14]. This increased frequency of fungal infection can be explained by the high humidity, high temperature [15] together with continuous wetness and profuse perspiration [1].

In our study, we found sunburn in 11.9%, contact dermatitis in 9.3% and pruritus in 6.9% of subjects. An increase in the skin diseases related to sun exposure and this proved the effect of chronic cumulative sun exposure [16]. Sunburn is dangerous condition that is frequent among seafarers. In addition to malignant consequences, ultraviolet radiation may cause phototoxic and photo-allergic reactions. It is important that adequate protection to UV-radiation is given to fishermen. Excessive eccrine secretion (sweat) or hyperhidrosis may be generalized or localised (hands, feet, axilla and face). It is triggered by thermal, emotional and may result in bromhidrosis (malodour) and occupational difficulties due to sweating under occlusive gloves and safety shoes. Sweat may promote fungal infections and/or cause contact dermatitis due to irritation or allergy to components (latex, rubber additives, or chromium in leather) [16]. Chemicals are often used in ship operation, cleaning and maintenance. If skin is exposed to chemicals side effects such as drying and irritation of the skin, permanent skin damage, allergic reactions and more serious side effects such as cancer can occur. It is recommended that protective clothing should always be worn when working with chemicals. On a day-to-day basis, moisturizing is essential for healthy skin. Moisturizers should be applied day and night, and ideally following a shower or bath as the moisturizer is able to trap some of the moisture and use it to hydrate the skin [17].

Cutaneous pathologies related to exposure to seafood (fish, crustaceans or molluscs) are mainly irritant contact dermatitis, urticaria and contact dermatitis to proteins more rarely allergic contact dermatitis [18]. In the study among fishermen in Basrah, contact dermatitis was found in 10.9% of subjects [12]. In the literature, the prevalence of occupational protein contact dermatitis ranges from 3% to 11% [19].

The study showed that marine stings were very common among fishermen; all of them gave history of stings uncountable times during the work. This is related to their direct contact with stinging creatures.

During our epidemiological survey, inadequate prevention and treatment of acute skin disorders and chronic skin diseases were observed. Based on these findings, it became clear that educational measures would be needed to promote the skin health. Educational meetings must be prepared, alerting those working in the in fishery sector with

advice about the management of major skin hazards and specially the prevention of wound infections [20]. In Brazil, the educational booklets' information was considered easy to grasp by all fishermen. Older fishermen, despite recognizing the usefulness of the information in the booklets, were more resistant to adhering to the guidelines and tended to stick to some traditional inadequate procedures to treat fish accidents, remained resistant to applying sunscreen regularly and/or wearing sun protective clothes for either cultural reasons or difficult to change misconceptions [9].

CONCLUSIONS

This study showed that marine fishing is a hazardous occupation in which the fishermen are victims of many skin diseases caused by their hard working environment. Exposure to chemical, physical, biological risk factors can lead to different skin diseases, though several individual (genetic) factors influence the outcome too. The majority is caused by wet work, workplace exposure to chemicals and high ultraviolet radiation from the sun. Contact dermatitis is the most prevalent and may pose a serious threat to the work ability of the individual. The prevention of occupational skin diseases requires a comprehensive approach with synchronized activities of the dermatologist, the occupational physician, the occupational hygienist and the occupational safety and health expert. The elaboration of the prevention approach needs a cooperative spirit; it will be more accepted and applied by all fishermen, if their representatives are involved in its preparation. The realization of information and sensitization campaigns about the skin health must be based on the results of prevalence surveys. Individual and collective communications and actions must be lead amongst fishermen.

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