CASE REPORT

A Patient of Fish Odour Syndrome with Recurrent Tinea Corporis

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Abstract

This was a case of the 43-year-old male complaining of severe well-demarcated irregular-shaped, centrally non-cleared, extensive, non-scaly plaques with raised borders. The patient was having severe itching all over the body. The interesting fact about this case is that this patient's sweat has had the smell of rotten fish for the last 5 years. This patient is a known case of Fish odour syndrome diagnosed by the presence of trimethylaminuria in his urine 5 years back. The patient informed us that when he didn't have the bad odour in his sweat, he did not develop the above-mentioned lesions of tinea corporis. The patient was very frustrated and socially isolated because of severe itching and the bad odour in his sweat. The role of trimethylamine (TMA) causes bad odour in the sweat, mouth and urine. We don't encounter cases like this very often and we are reporting this case because after a detailed inquiry about the patient's family history the same condition persists with 4 other patient's family members but they did not report themselves as they are mostly less educated, live in a rural area and they don't want to visit any doctor. We want to increase the knowledge of the medical fraternity to deal with these cases in a better way and maybe we are opening a new horizon for the researchers.

Keywords: *Fish odour syndrome, Itching, sweat, Trimethylamine (TMA), Tinea Corporis.*

INTRODUCTION

Fish Odour syndrome is not a very common disease. This problem presents around 1 in 40,000 people [1]. The patient affected with this disease is in very much distress, socially isolated and his or her peers don't accept the patient's presence. Most of the patients having this problem became very anxious and entered into severe depression. Communities all around the world don't accept this as a disease as it has been perceived as an unhygienic condition. People around patients think that a patient is an unhygienic person and the patient doesn't know the importance of hygiene but the reality is the other way around. Patients with Fish odour syndrome try to take bath 3 or maybe 5 times a day, excessive use of perfumes and body spray to mask this problem, but they can't mask it. Most patients present in dermatologic clinics with eczematization of skin after excessive usage of soap and perfumes. The main pathogenesis to cause fish odour syndrome is patients' ability to oxidize the TMA which is produced by intestinal bacteria is abnormal. Non-oxidized TMA has the role to increase the chances of skin fungal infection is still unknown. Unlike fish odour syndrome, skin fungal infections are very common around the world, especially in people living in hot humid environments. Patients of Tinea corporis mostly present to dermatologic or general practitioner clinics with irregular or sometimes annular well-demarcated centrally clear scaly plaques with raised erythematous borders. Very interestingly our reported patient informed us that before 5 years he had been sweating but he never developed a fungal infection but once he developed the rotten smell in his sweat the cutaneous fungal infection frequency and intensity rose day by day. He was very anxious and frustrated and socially isolated himself as he wasn't able to handle the embarrassment he felt because of the bad odour in his sweat and itching all over his body. According to the patient's history, there could be a chance of any relation between Fish odour syndrome and in the growth of the fungus on the skin or another way around but this idea still needs to be discovered more in detail.

CASE PRESENTATION

A 43-year old male came to us complaining about the increasing severity of tinea corporis infection every year for the last 5 years and it has been diagnosed by KOH preparation. The patient was diagnosed with a case of fish odour syndrome 5 years back by the positive presence of the TMA in his urine. The patient informed us about this problem in detail as before 5 years, in every summer he sweat a lot but his family and friends never complained about the rotten smell present in his sweat and mouth and before 5 years the patient never developed any skin lesions even though all the circumstances of his life remained same and no change had been noted in his environment and neither he was taking any medicine. The patient informed us after collecting the detailed family history that his few family members have the same problem but in milder form, and they don't want to visit any doctor and they think that bad

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odour in sweat is normal and the lesions developed on the skin is because of some allergy. This patient is the most educated one among all family members and he understands the problem and visited the dermatologist.

Since every successive year the intensity of foul smell is increasing day by day and the intensity of the fungal infection also proportionally increasing day by day in the patient. The severity and spreading of tinea corporis can be easily recognizable in **Figs. (1A-1C)**.

Figs. (1A): Irregular plaque with prominent edges on the neck and upper chest, **(1B)** Irregular erythematous plaque without central clearing on the abdomen, **(1C)** Extension of erythematous plaque from abdomen into groin.

DISCUSSION

This Fish odour syndrome is a very concerning and psychological affective disorder. The main factor which sets forth the bad odour in apocrine and eccrine sweat, mouth, and urine is Trimethylamine (TMA) [2, 3]. Degradation of choline and carnitine in food produced odourless trimethylamine N-oxide by intestinal bacteria and affected individuals are unable to oxidize this substance.

There are 2 major causes for fish odour syndrome a) genetic, b) acquired.

a) Mutation in the flavin-containing monooxygenase 3(FMO3) gene can occur as a genetic mutation that can cause fish odour syndrome [4, 5].

b) Increased production of trimethylamine from its precursor by gut bacteria, in conditions such as blind loop syndrome, uremia, and liver diseases can cause secondary trimethylaminuria.

After eating seafood, during menstruation and in stress, the unpleasant odour getting worse. Most of the time sufferers are unaware of the smell because the patient got desensitized by their bad odour.

7% of patients who have been taunted by family and friends about bad odour are diagnosed with fish odour syndrome. The Fish odour syndrome can be diagnosed by oral TMA challenge test in which direct measure of TMA in urine, both heterozygous carriers and affected individuals have abnormally elevated excretion of TMA in urine. A urine test is used to diagnose trimethylaminuria. The person's urine is tested to look for higher levels of trimethylamine. Testing can be done by giving choline by mouth followed by urine collection a certain number of times over 24 hours. It has been noted that TMA N-oxide has been used as a precursor for the risk of mortality in cardiovascular and renal problems [6].

There are few remedies to prevent fish odour syndrome. Choline and carnitine should be low in the diet. Neomycin and metronidazole temporarily reduce the bacteria in the gut that degrade the carnitine and choline [7]. The use of copper chlorophyllin and charcoal has been shown to reduce urinary trimethylamine concentration in patients suffering from fish odour syndrome.

Tinea Corporis is called, ringworm of the glabrous skin. Abnormal growth of the fungi in the epidermal layer stratum corneum is a cause of its clinical features [8].

Definition of tinea corporis is the lesion of the limb and trunk only. Specific parts of the body for *e.g.* in the scalp it is called tinea capitis, in the groin region it is called tinea cruris, in the foot, it is called tinea pedis, in nails, it is called tinea unguium, *etc* [9].

Factors affecting Tinea Infection: There are so many factors that affect the spreading of infection for *e.g.*, age groups, exposure, sebum production, fluctuation of immunity, ethnic difference, professions, moisture of skin endocrine and metabolic diseases for *e.g.* Cushing syndrome, malnutrition, *etc.*

Histopathology: Tinea corporis may provoke epidermal changes for *e.g.* patchy hyperkeratosis, hypogranulosis, parakeratosis and mononuclear invasion. The dermal infiltrate of lymphocytes and histiocytes are largely peri-vascular [10].

Pathogenesis of tinea corporis is a natural infection contracted by deposition of viable hyphae or arthrospores. The source of the lesion could be the animals or any other active lesion. This infection is transmissible by

direct contact because of fomite transmission or getting spores directly by contact [11].

Clinical features: Infection can spread from the scalp to the trunk or from the groin area to the abdomen or in the lower limb. Typical lesions are mostly circular, sharply marginated with a prominent edge. The clinical pattern can be worsened or atypical involving deep layers of skin for *e.g.* deep layers of epidermis, dermis, and subcutaneous layers if a patient has abnormal cellular immunity for *e.g.* diabetes, AIDS, missing plasma factors, *etc* [12]. Tinea corporis is generally less inflammatory than its other family members.

CONCLUSION

Fish odour syndrome is a very worrisome and problematic condition. Very little awareness is available in society about this disorder. Patients mostly isolated themselves. In addition to rotten and unbearable odour patients also have excessive itching all over the body. Proper treatment of these bad odour diseases is not available. Research should be done on the correlation of the Fish Odour Syndrome and Tinea Corporis and any role of TMA in the growth of the Tinea Corporis in the stratum corneum should be dugout. This case report will be a very good whistleblower for the researcher all over the world and maybe we will be able to find out any specific root cause for the growth of tinea corporis infection on the skin in presence of Fish Odour Syndrome. We have to work hard to find out the new treatment options for tinea infections and that could be possible after finding out any new association and triggering factors for tinea infections as people of low socio-economic areas, are having extensive tinea infections and this infection getting resistant day by day from antifungals available in the market. In our practice we are encountering every other case with resistant fungal infections and this case report may help researchers in the future as food for thought.

CONSENT FOR PUBLICATION

Written Informed consent was taken from the patient.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. Shephard E, Treacy E, Phillips I. Clinical utility gene card for: Trimethylaminuria. Eur J Hum Genet 2012; 20(3): 1-5.
2. Sabir N, Jones EA, Padmakumar B. Trimethylaminuria. BMJ Case Rep 2016; 2016: bcr2015213742.
3. Arseculeratne G, Wong AK, Goudie DR, Ferguson J. Trimethylaminuria (fish-odour syndrome): a case report. Arch Dermatol 2007, 143: 81-4.
4. Phillips IR, Shephard EA. Primary Trimethylaminuria. In: Adam MP, Ardinger HH, Pagon RA, *et al,* Eds. GeneReviews® [Internet]. Seattle (WA): University of Washington, Seattle: 1993-2021.
5. Bain MA, Fornasini G, Evans AM. Trimethylamine: metabolic, pharmacokinetic and safety aspects. Curr Drug Metab 2005; 6(3): 227-40.
6. Winther SA, Øllgaard JC, Hansen TW, von Scholten BJ, Reinhard H, Ahluwalia TS, *et al.* Plasma trimethylamine N-oxide and its metabolic precursors and risk of mortality, cardiovascular and renal disease in individuals with type 2-diabetes and albuminuria. PLoS ONE 2021; 16(3): e0244402.
7. Li M, Al-Sarraf A, Sinclair G, Frohlich J. Fish odour syndrome. CMAJ 2011; 17: 929-31.
8. Sentamilselvi G, Janaki C, Murugusundram S. Trichomycoses. Int J Trichol 2009; 1: 100-7.
9. Yee G, Al Aboud AM. Tinea Corporis. In. StatPearls, Ed. Treasure Island (FL): StatPearls Publishing: 2021.
10. Park YW, Kim DY, Yoon SY, Park GY, Park HS, Yoon HS, *et al.* Clues' for the histological diagnosis of tinea: how reliable are they? Ann Dermatol 2014; 26: 286-8.
11. Kanamori H, Rutala WA, Weber DJ. The role of patient care items as a fomite in. healthcare-associated outbreaks and infection prevention. Clin Infect Dis 2017; 65(8): 1412-19.
12. Brown J, Carvey M, Beiu C, Hage R. Atypical tinea corporis revealing a human immunodeficiency virus infection. Cureus 2020; 12(1): e6551.