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Aetiology of dermatomycoses from a historical perspective

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Abstract

Dermatomycoses begin as a red rash on the skin, gradually spreads to its sides and clears from the centre, thus forming a circle. Due to which this disease is called ringworm infection. Research data shows that this disease has become the fastest-growing disease worldwide, with a prevalence rate of between 25% and 27%. The identification of this disease begins with the earliest Unani literature. Hippocrates also mentioned this disease since then till today scientists are busy finding the causes of this disease. The Khilti (humoral) cause of the disease is described in Unani literature, while in modern times it has been attributed to a group of fungi called dermatophytes, but in more recent research, researchers have identified other fungi as well. In this review, the detailed historical background of the understanding of the disease is explored.

Keywords: Dermatomycoses, dermatophytoses, tinea, ringworm, fungal infection

Introduction

Dermatomycoses, Dermatophytoses, Tinea, and ringworm infections are fungal infections of the skin, hair, and or nails. These infections have been reported since ancient times and are increasing at an alarming rate with more difficult relapse conditions and resistance to modern drugs. A review of the literature on traditional medical systems of medicine, particularly Greco-Roman, Persian, and Arabic medicine, collectively known as Unani medicine, reveals that these infections were described as Qooba, Daad, Paryoon, and Daryoon. For a better understanding of these infections, this review is done using all possible available resources.

Material and Method

The literature review is carried out by visiting various libraries at Aligarh Muslim University; Department of Amraze Jild wa Zohrawiya, Department of Moalijat, AK Tibbiya Cioole, JN Medical College and central library, and online search at Science Direct and Google Scholars etc. The literature includes classical Unani Makhtutat (handwritten books), books, journals, etc. The classical literature of Arabic and Persian languages was translated with the help of Experts.

Observations

Fungi are amongst the oldest recognized causes of infection in humans^[1]. Various scholars have mentioned this disease with different names in different languages in their treatises, manuscripts, article, books and or other publications, which are summarized as under.

460-375 BC Buqraat (Hippocrates) wrote about 'aphthae', the sores in the mouth that modern mycologists have identified as thrush^[2].

30AD Aulus Cornelius Celsus, the Roman encyclopedist, described a suppurative infection of the scalp that later was recognized as kerion of Celsus, in his book, "De Re Medicinal"^[3].

129-216AD Jalinoos (Galen) as reported by Abul Mansurul Hasan Qumri in his book, "Ghina Muna" mentioned the treatment of this disease^[4].

810-895 Abul Hasan Ali bi Suhail Rabban Tabri describe the causation of Qooba (Dermatomycoses) in his book, "Firdous ul Hikmat" (Urdu Translation) by Hakim Rasheed

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Ashraf Nadvi as Barudat & Ghilzat of Khoone Fasid (Cooling & Condensation of acrid Blood) produced in a result of Zofe Quwwate Hazima (Weakness of Digestive Faculty) [5].

854-925/935 [6] Abū Bakr Muḥammad ibn Zakariyyā al-Rāzī (Rhazes) in his book, “Al Havi Fit Tib” mentioned it as a roughness appearing with itching, in two forms; Blackish and Reddish [7].

854-925/935 Abū Bakr Muḥammad ibn Zakariyyā al-Rāzī (Rhazes) in his book, “Kitab al Fakhir Fit Tib” mentioned that it is similar to “Safa Yabisa” [8]

Circa 970 AD [9] Abu'l-Hasan Ahmed Ibn Muhammad al-Turunji al-Tabari in his book, Kitab al-Mu'alajat al-Buqratiyyah, a medical encyclopaedia described Daad (Tinea) as Urticaria like superficial disease of the skin, which appears usually as round dotted lesions and spreads like rings to cover a larger area. He classified the disease into 03 types; (i) Damvi, caused by the Fasade khoon (deranged blood) and Ratoobate Fasida (deranged fluid), (ii) Ratoobi, caused by derangement of ratoobat with heat and Afoonat (infection) and (iii) Saudavi caused by Sauda formed on burning of the akhlaat (humours) [10].

930-999 Ali bin Abbas Majusi wrote in his treatise, “Kamil us Sana” (Urdu translation) by Hakim Ghulam Husnain Kanturi, “Dad (Dermatomycoses) is produced by Murra Sauda in result of excessive intake of source of such humour in diet [11].

d 980-990 [12] Abu Mansur al-Hasan ibn Nuh al-Qumri, in his book, “Ghina Muna” described that burnt khoon, after converting to cauda causes this disease and classified the disease into 02 types; (i) Kaghzi Daad, the disease limited to the skin and (ii) Bhainsa Daad, the disease extended to the subcutaneous level [13].

980-1037 Abu Ali al-Hussain Ibn Abdallah Ibn Sina, in his Book, Al Qanoon Fit Tib (Canon of Medicine) described its cause as Tez Ratubat with a high degree of Hiddat when mixed with condensed matter, cauda [14].

1040–1136 [15] Zayn al-Din Sayyed Isma‘il ibn Husayn Gorgani, in his book, Zakhirah-i Khvarazm-Shahi described the child buud (bad humour); either child tez wa raqeeq or khilte ghaleez wa saudavi and Quwwate Tabyat as the causes of this disease [16].

1141-1213 Muhazzabuddin Abul Hasan Ali bin Ahmad bi Ali bin Hubal Baghdadi, in his book, “Kitab ul Mukhtaraat fit Tib” mentioned pure saudavi and saudavi mixed with Dam as the cause of ‘Dry Qooba’ and ‘Wet Qooba’ respectively [17].

1233-1286 Ameenu uddoula Abul Farj Ibnul Qaf Almaseehi described in his book “Kitabul Umda Fil Jarahat that it is Roughness of the skin caused by concentrated Suda mixed Balghame Maleh [18].

1380–1422 [19] Mansur ibn Muhammad ibn Ahmad ibn Yusuf Ibn Ilyas, wrote in his treatise “Kefaye Mansoori” that Qooba (Tinea) starts as a rough papule on the skin, which may be reddish or Blackish [20].

D-1722 [21] Mohammad Akbar URF Mohammad Arzani bin Meer Haji Mohammad Muqem Hussain in his book, “Tibe Akbar (Urdu Translation) by Hakim Mohd Hussain, mentioned it as a roughness of the skin with itching in Red or Black shade, usually in circles. He also described 03 stages of this disease; 1st Initial stage- confined to the skin, 2nd Started affecting subcutaneous portion and 3rd affected the Muscles [22].

D-1722 Mohammad Akbar urf Mohammad Arzani bin Meer Haji Mohammad Muqem Hussain in his book, “Mufarreh Ul Quloob (Urdu Translation as Akseerul Qoloob) mentioned it as Sehej-e-Fakhaz, which means excoriation of the groin region, while including the other regions as well, i.e. axilla, behind the ears and the folds of the neck [23].

D-1722 Mohammad Akbar URF Mohammad Arzani bin Meer Haji Mohammad Muqem Hussain in his book, “Hudoodul Amraz” described the disease in a similar manner as in Tibe Akbar and Mufarreh ul Quloob [24].

1815-1902 Mohammad Azam Khan in his Book, “Akseere Azam”, mentioned it as a roughness of the skin associated with itching and reddish periphery. He mentioned Damehad Late of mixed with Ghleez Mirra Sauda as its cause. He described Balghame Boriqi mixed with Ratubate Raqeeq as the cause of Chronic Qoobq [25].

1813 Thomas Bateman wrote and exhibited a concise view of the diagnostic symptoms and method of treatment in, “A practical synopsis of cutaneous diseases according to the Arrangement of Dr. William [26].

1817 Thomas Bateman published an Atlas, “The Delineation of cutaneous diseases” exhibiting the characteristic appearance of the principal Genera and species comprised in the classification of the late Dr. William [27].

1830 Agostino Bassi, an Italian entomologist claimed that the devastating muscardine disease of silkworm was due to a microscopic fungus, *Tritirachium* shortage (later name as *Beauveria bassiana* in his honour) [28]

1837 Remake reported the fungal nature of Favus [29].

1840 David Gruby first described Tinea tonsurans (Tinea capitis) and linked specific fungi to the conditions of favus. In the 1850s, this fungi was identified as *Trichophyton* [29].

1841 Berg reported oral Candidosis [30]

1842–1844 David Gruby, a Paris-based Hungarian physician wrote Fungi as a source of human diseases [30].

1849 Wilkinson described vaginal candidosis [31].

1846 Eichstedt described Tinea versicolor [31]

1856 Beigel reported white Piedra [31].

1860 Agostino Bassi and Louis Pasteur described that living microorganisms might cause infectious diseases. They identified fungal infections as the cause of economic

problems in agriculture and related industries ^[31].

1878 Charles Philippe published coloured illustrations, “Lecons cliniquessur lesteigens” ^[32].

1885 Sims Woodhead Arthur Hare published Pathological Mycology ^[32].

1886 Anton De Bary’s Comparative Morphology and Biology of Fungi, Mycetozoa and Bacteria ^[32].

1890 Raimond Sabouraud classify these fungi into four genera ^[3]

1891 Cerqueira reported Tinea nigra ^[32].

1899 Muir’s and Ritchie’s Chapter entitled ‘Non-pathogenic Micro-organism’ in “Manual of Bacteriology” ^[32].

1906 Nafees kirmani-wrote in “Nafeesi”, (Urdu Translation) that Qooba is caused by the mixing of Tez Raqet Maeyat and Saudavi Khilte Ghaleez ^[33].

1906 Sequeira JH published the Varieties of Ringworm ^[34].

1911 Horta described Black Piedra ^[32]

Circa 1914 Syed Abid Hussain Luckhnawi in his Urdu translation of Moalijate Sadeedi, which is Sharhe Mojizul Qanoon Described Ratubate Mae and Saudavi kilt as the causes of Qooba ^[35].

1927 Nannizzi reported about the sexual state of Microsporium gypsum ^[32].

1930 Hakim Mohammad Abdul Aleem Deputy Nasrullah Khan Khurjavi in his book “Shareh Rubaiyat-Tibbe Yousufi stated that its cause is Khoone Lateef Tez mixed with Murra Sauda ^[36].

1931 Hakim Ghulam Jilaani, in his book, “Makhzane Ilaj almaruf Bayaz Jilani”, jild awwal, described it as an infectious disease affecting the neck, back and buttock ^[37].

1931 Hakim Ghulam Jilaani, in his book, Makhzane Hikmat mentioned the disease contagious and Nabati Kirm as the cause of wring worm ^[38].

1934 Emmons published the current classification of Dermatophytes ^[32].

1943 Ainsworth published Dictionary of the Fungi ^[32].

1952 Ainsworth and Kathleen Sampson Published Medical Mycology ^[32].

1952 Lodder and Kreger-van Rij described the taxonomy of years ^[32].

1958 Gentles reported the successful treatment of tinea capitis with Griseofulvin ^[32].

1965-73 Ainsworth AS, Sussman and FK Sparrow published the multi-volume The Fungi: An Advanced

Treatise ^[32].

1983 William G Crook’s, “The Yeast Connection”. It attributed various chronic conditions to the overgrowth of C Albicans ^[32].

2015 Echavarria M and Robinson CRTA reported 100000 identified fungal species in the “Manual of clinical microbiology” ^[39].

2020 Xu J reported that 14000 fungal species have been identified ^[40]

2021 Stajich J.E *et al* and Konopka J.B *et al* reported that more than 700 fungal species are associated with humans, as commensal or pathogenic ^[41-43].

On the basis of the invasion of fungi, fungal diseases among humans can be categorized into 03 types; (i) Superficial Mycoses like Athlete’s Foot, (ii) Subcutaneous Mycoses, like Mycetoma (Madura’s foot) and (iii) Systemic Mycoses, like Aspergillosis.

In Superficial mycoses, skin, nails and hair are infected by a related group of fungi, called Dermatophytes causing Dermatophytes. Such fungal infections are widespread all over the world and are predominant in tropical as well as subtropical regions. Now a day, Non-dermatophyte Moulds (NDM), and yeasts are also being reported among the patients of Dermatophytes. These infections are spreading fast globally with the 20-25% reported rate of prevalence⁴⁴ which varies in different countries ^[45, 46] with the highest prevalence among tropical and subtropical nations, like India ^[47].

Before 2nd World War in Germany, Microsporium audouinii and Epidermophyton floccosum was the leading type of fungi, then Trichophyton rubrum became the most frequently isolated fungus all over the world followed by T. mentagrophytes. This change is typical for Central and North Europe with the increase in the incidence of Tinea pedis. Whereas in Southern Europe and in Arab countries M. canis and T verrucosum, are the most frequent Dermatophytes ^[48, 49].

As per the well-established fact, Dermatophytes are caused by Dermatophytes but nowadays, there is some reported incidence of this disease caused by non-dermatophytic Moulds (NDM), which is isolated in the patients of Onychomycoses ^[48]. The first case from Jammu district of India is reported of superficial mycosis caused by Bipolaris cynodontis ^[50].

The newer insight into the causation of the types of fungi is being observed, which was also reported in the study carried out at AK Tibbiya College Hospital during thesis work in the year 2022. Documentation of the plant pathogenic fungi becoming the cause of the skin fungal infection among the patients is the latest edition of the information to the etiology of Dermatophytes ^[51].

Presently uncommon Dermatophyte species in the patients would not be restricted to specific geographic locations and may spread to different parts of the countries in the future by travellers and or immigrants ^[52].

Conclusion

Since ancient times, fungal infections of the skin have been described in different languages with different names but with similar descriptions of symptoms. According to the

medical philosophy of the time, these infections were attributed to various etiologies, which made it clear that these infections had been causing disease in humans since ancient times, and that they were being treated with natural remedies.

Conflict of Interest

Not available

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