Unrecognised underlying condition for COVID-19: perspective study of meridian and M-shaped male baldness

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Abstract

Male androgenetic alopecia (MAA) is observed as a high severity risk factor but not listed within underlying COVID-19 conditions due to scanty available evidence. From a Chinese medicine (CM) perspective, the pathogenesis of MAA is overlapping with many recognised underlying conditions. This article compares CM meridian theory with MAA pattern progression to illustrate 1) the morphological and topographical superposition between the MAA progressing pattern and CM meridians, 2) damp-heat dominated body constitution presences among MAA patients as well as some underlying COVID-19 conditions, 3) vulnerable body type should be alerted and recognised to avoid an increase in infectious severity rate. The fundamental acupuncture points of treatment are provided for a concrete clarification of MAA.

Keywords

COVID-19; Male androgenetic alopecia; Chinese medicine meridian; Hair; Underlying condition; Damp heat
Introduction

From March to June 2020, the rate of COVID-19 mortalities with "No pre-existing condition" in England and Wales, UK was nearly 10% (Table 1)[1], placing just after dementia, heart disease, and pneumonia/influenza. Given the new strain which mutated near the end of 2020, the increased infection rate raises a huge concern for those who have an actual underlying health condition. However, an additional point of great concern is that of unrecognised health conditions which contribute toward the increased severity of COVID-19. One such unrecognised condition is male androgenetic alopecia (MAA).

MAA patients, generally bald and bushy-bearded, have no specific need to worry about their health, but the potential causes of MAA might trigger more serious illnesses. Wambier et al [2] observed that among hospitalised COVID-19 patients, two thirds (79% of male and 42% of female patients with an average age of 62.5 and 71) have androgenetic alopecia, much higher rates than in a similar age range Caucasian population of 31-53% and 38%. MAA's pathogenesis is still unclear but can be studied with CM meridian theory topographically and morphologically.

This interdisciplinary anatomisation aims to explore how MAA constitutes an unrecognised health condition increasing the risk of high COVID-19 severity. The method used is based in CM, examining the common factors of underlying health concerns.

MAA background

MAA starts with the frontal temple hair fading, and gradually, within years, forming an M-shape while simultaneously the vertex bald patch enlarges, where excessive androgen is found in the hairless hair follicles but not elsewhere in the body. The MAA incidence rate increases with age as hormone levels generally decrease; interestingly, however, baldness never occurs to someone with no androgen [3,4]. Researchers [5] have found that excessive androgen restricting the development of dermal papilla vasculature is converted from testosterone by over-activity of 5α-reductase enzymes (5αRs) which appear not only in the scalp but also in the urogenital system, the skin (particularly genital skin), and the liver.

Interestingly, in the excessive androgen bald areas of early MAA patients, histologists have detected unexplained micro-inflammation which can induce the dense connective tissue to experience fibrosis and calcify within a few years. This only occurs at galea fascia, not on its bordered muscle sections, which have better vascularisation than fasciae [6]. This pathophysiological mechanism of micro-inflammation is still undefined but appears to indicate that the MAA pattern is related to the function of the internal organs.

MAA causes in CM

Traditionally CM studies in MAA are predominantly performed through zangfu diagnosis, identifying the MAA mechanisms as liver-kidney yin deficiency and damp-heat excess (aka. inflammation in CM) either malnourishing or blocking the scalp hair follicles [7]. This theory may explain why castrated men never experience MAA [2] but does not explain the pattern of MAA and its joint feature of bushy beards and acne situating along facial stomach channels and their meridian-sinews. According to CM theory, "sparse" hair in the stomach channels is due to qi deficiency, but a hairless scalp and hairy face are inconsistent with this (Table 2) [8]. Hence, the established zangfu theory might be too general to explain the MAA pattern.

MAA in meridian systems

CM meridian systems encompass the entire body. There are 12 zangfu-related channels and their 12 peripheral sinew-related meridian-sinews, which (i) attach all musculoskeletal systems such as galea and genitalia
Table 1 (From ONS): "Most common main pre-existing conditions in deaths involving COVID-19, all ages and sexes, England and Wales, UK, deaths occurring between March-June 2020"

| Main pre-existing condition | Number of deaths | Main pre-existing condition | Number of deaths |
|----------------------------|------------------|----------------------------|------------------|
| Dementia and Alzheimer's disease | 12,323 | Dementia and Alzheimer's disease | 543 |
| Ischaemic heart diseases | 4,773 | No pre-existing condition | 294 |
| Influenza and pneumonia | 4,426 | Chronic lower respiratory diseases | 233 |
| No pre-existing condition | 4,169 | Ischaemic heart diseases | 222 |
| Chronic lower respiratory diseases | 3,823 | Symptoms signs and ill-defined conditions | 166 |
| Symptoms signs and ill-defined conditions | 3,260 | Influenza and pneumonia | 147 |
| Cerebrovascular diseases | 1,676 | Cerebrovascular diseases | 102 |
| Diabetes | 1,219 | Diseases of the urinary system | 51 |
| Diseases of the urinary system | 1,081 | Diabetes | 49 |
| Hypertensive diseases | 906 | Heart failure and complications and ill-defined heart disease | 34 |
| Heart failure and complications and ill-defined heart disease | 627 | Malignant neoplasm of trachea bronchus and lung | 31 |
| Malignant neoplasms of lymphoid haematopoietic and related tissue | 491 | Hypertensive diseases | 30 |
| Malignant neoplasm of trachea bronchus and lung | 443 | Parkinson's disease | 25 |
| Disease                                              | Number |
|-----------------------------------------------------|--------|
| Parkinson's disease                                 | 424    |
| Malignant neoplasm of prostate                      | 388    |
| Cardiac arrhythmias                                 | 351    |
| Cirrhosis and other diseases of liver                | 245    |
| Fracture of femur                                   | 183    |
| Pulmonary oedema and other intestinal pulmonary diseases | 178    |
| Malignant neoplasms of breast                       | 155    |
| All deaths involving COVID-19                       | 47,80  |

| Disease                                              | Number |
|-----------------------------------------------------|--------|
| Cirrhosis and other diseases of liver                | 23     |
| Cardiac arrhythmias                                 | 20     |
| Malignant neoplasms of lymphoid haematopoietic and related tissue | 18     |
| Malignant neoplasm of prostate                      | 17     |
| Malignant neoplasms of breast                       | 15     |
| Diseases of the musculoskeletal system and connective tissue | 13     |
| Pulmonary oedema and other intestinal pulmonary diseases | 13     |
| All deaths involving COVID-19                       | 2,450  |
originating 5αRs and testosterone (ii) flow from the extremities to the trunk and head, especially via genitalia with foot related meridians (iii) are nourished only by Channels which circulate qi, blood, yin, and yang of zangfu.

The genitalia are known in CM as master-

Table 2. Illustrating qi and blood impacting Stomach and Gallbladder channel on facial region [7]

| Meridians   | Qi, blood feature | Facial hair | Rich qi and rich blood | Rich qi and poor blood | Poor qi and rich blood | Poor in both qi and blood |
|-------------|-------------------|-------------|-------------------------|------------------------|------------------------|--------------------------|
| Stomach     | Rich in qi & blood| Beard       | long and bushy          | short                  | sparse                 | no hair                  |
| Gallbladder | Rich in qi, poor in| Temple      | Bushy                   | sparse                 | Short & bushy          | no hair                  |

Figure 1. Illustration of MMA sequence within meridian system [7]
Table 3. Meridian-sinews and 14 channels appeared in connected regions between genital region and scalp vertex\(^7\).

| Confluent Node       | No. of meridians | Meridian-sinews | Meridian-channels                                      |
|----------------------|------------------|-----------------|--------------------------------------------------------|
| Scalp Vertex         | 4                | Foot-shaoyang   | Liver, Bladder, Governor Vessel                        |
| Sides of galea       | 4                | Foot-taiyang, Foot-shaoyang | Gallbladder, Liver                                    |
| Occiput              | 4                | Foot-taiyang, Foot-shaoyin | Bladder, Governor Vessel                              |
| ST8                  | 7                | Foot-shaoyang, 3 Hand-yangs | Stomach, Galbladder, Yangwei                          |
| ST12                 | 12               | 3 Foot-yangs, Hand-taiyin | Stomach, Lung, Small-intestine, Triple Burner, Bladder, Large-intestine, Gallbladder, Liver |
| Underarm             | 9                | 3 Hand-yins, Hand-taiyin | Lung, Heart, Pericardium, Gallbladder, Yangwei       |
| Lungs                | 12               | 3 Hand-yins, Foot-taiyin | Kidney, Liver, Gallbladder, Heart, Pericardium, Large-intestine, Conception Vessel, yinwei, |
| Ribs                 | 7                | Foot-shaoyang, Foot-yangming | Gallbladder, Liver, Governor Vessel, belt, yangwei, |
| Jiaji                | 6                | Hand-yangming(T1-7), Foot-yangming(T11-12), foot-taiyang | Bladder , Governor Vessel (collaterals), |
| Spinal               | 3                | Foot-shaoyin    | Governor Vessel, kidney                               |
| Master-sinew/pubis   | 10               | 3 Foot-yins, Foot-yangming | Liver, Kidney, Conception and Governor Vessels, Thrusting Vessels, Gallbladder |

sinew, including within the outer pubic hairline, superiorly connecting the chest and diaphragm, inferiorly penetrating the pelvic base (coccyx), and anteroposteriorly rising into the scalp vertex\(^9\), functionally regulated and encircled by the liver channels and their meridian-sinews. Anatomically, the genitalia bridge anteroposterior superficial back fascia line (SBFL) ascending to the galea\(^10,11\).

The inflammation or damp-heat in CM is determined by lifestyle factors such as a rich diet, alcohol consumption, and emotional stress and initially impacts the stomach and spleen before passing on to other organs. *Lingshu* illustrates meridian-sinews and channels extending between the master-sinew.
and galea and the confluent positions containing the lungs and the area above (ST12) (Figure 1, Table 3)\(^7\). The damp-heat carried by channels influences these confluent positions. The liver and gallbladder channels appear seven times in Figure 1 and Table 3 as the most frequently emerging channels, suggesting a strong interconnection with the meridian-sinews, especially the foot-jueyin at the centre of master-sinew (the genitalia).

### Morphological analysis

M-shaped baldness starts on ST8 points due to damp-heat from the mid Burner (stomach, spleen, gallbladder and liver) and manifests in abdominal distension, unsatisfied defecation, heavy legs, dull headache, thick yellow tongue coating, emotionality, and low motivation. Due to the heavy nature of dampness, perpetuated damp-heat falls to the lower Burner and results in instability of the master-sinew. The genital essence diffuses along liver channels as well as SBFL towards the scalp fascia inflaming the hair follicles, causing fibrosis and balding on the vertex around liver channels.

Accumulated damp-heat often leads to spleen yang deficiency, qi stagnation, blood stasis, food and phlegm obstruction, causes dermatological problems, and many chronic diseases but particularly diabetes, high blood pressure, and high cholesterol which are already recognised as pre-existing COVID-19 conditions\(^{12}\). This interdisciplinary pathogenesis based approach also indicates potential risk and recommends that taking extra precautionary measures for MAA patients is vital for avoiding the risk of high severity COVID-19.

### Treatment suggestion

This study is not intended to diagnose or treat MAA but rather to highlight to policymakers and health beneficiaries that many underlying COVID-19 conditions remain unrecognised. However, to better understand the MAA case, it is useful to provide some treatment suggestions as concrete examples clarifying the approach. From the aforementioned analysis, to avoid further burdens on the stomach and spleen, acupuncture is preferred over herb intake. Fundamental acupuncture strategy consists of three methods each containing two phases (PH1, PH2):

1) Local needling on hairless galea to de ossify galea, improve local qi-blood, and regenerate lifeless hair follicles.

   **PH1**: ST8, ST7, GB3, GB13, GB15, UB4, UB3, GV24

   **PH2**: GV20, GV21, GV19, EX-HN1, BL7, GB18

2) Distal needling on impaired channels and huatuo jiaji points to biomechanically open nutrient pathways between galea and genital region, so to ameliorate jiaji and its adjacent tendon conditions. Myers \(^{10}\) states that human structure is tension-dependent, comprehensively compensating for one fascia with the deformation of the rest, and topographically compacting the channels underneath and/or compressing and misshaping the organs.

   **PH1**: EX-B2 selected by palpation, GB20, GV16;

   **PH2**: EX-B2 selected by palpation, GB20, GV16, BL31-34;

3) Channel needling on damp-heat permeated channels to disperse obstructed and stagnated qi to regain body meridian homeostasis.

   **PH1**: ST44, ST43, SP2, SP3, LI2, LI3

   Yangming channels regulate master-sinew. Ying-spring and shu-stream points of stomach, spleen, and large intestine channels are employed for dispersing heat and dampness. Both yangming-meridians are in a "mother
child" relation. The child large intestine reduces excessiveness from the mother stomach.

PH2: LV3, LV8, GB41, GB34, ST40

The turbid food-qi enters the stomach, spreads to liver meridian networks resulting in shrunken sinews. In addition to the previous points, shu-stream and he-sea points of the liver and its associated gallbladder channels scatter dampness and divert the counterflow qi.

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