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## 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)<sup>[1]</sup>, 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<sup>[2]</sup> 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<sup>[3,4]</sup>. Researchers<sup>[5]</sup> have found that excessive androgen restricting the development of dermal papilla vasculature is converted from testosterone by over-activity of 5 $\alpha$ -reductase enzymes (5 $\alpha$ Rs) 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<sup>[6]</sup>. 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<sup>[7]</sup>. This theory may explain why castrated men never experience MAA<sup>[2]</sup> 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)<sup>[8]</sup>. 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"

England		Wales	
Main pre-existing condition	Number of deaths	Main pre-existing condition	Number of deaths
	12,323		
Dementia and Alzheimer's disease	3	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

Parkinson's disease	424	Cirrhosis and other diseases of liver	23
Malignant neoplasm of prostate	388	Cardiac arrhythmias	20
Cardiac arrhythmias	351	Malignant neoplasms of lymphoid haematopoietic and related tissue	18
Cirrhosis and other diseases of liver	245	Malignant neoplasm of prostate	17
Fracture of femur	183	Malignant neoplasms of breast	15
Pulmonary oedema and other intestinal pulmonary diseases	178	Diseases of the musculoskeletal system and connective tissue	13
Malignant neoplasms of breast	155	Pulmonary oedema and other intestinal pulmonary diseases	13
	47,80		
All deaths involving COVID-19	9	All deaths involving COVID-19	2,450

originating 5aRs 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

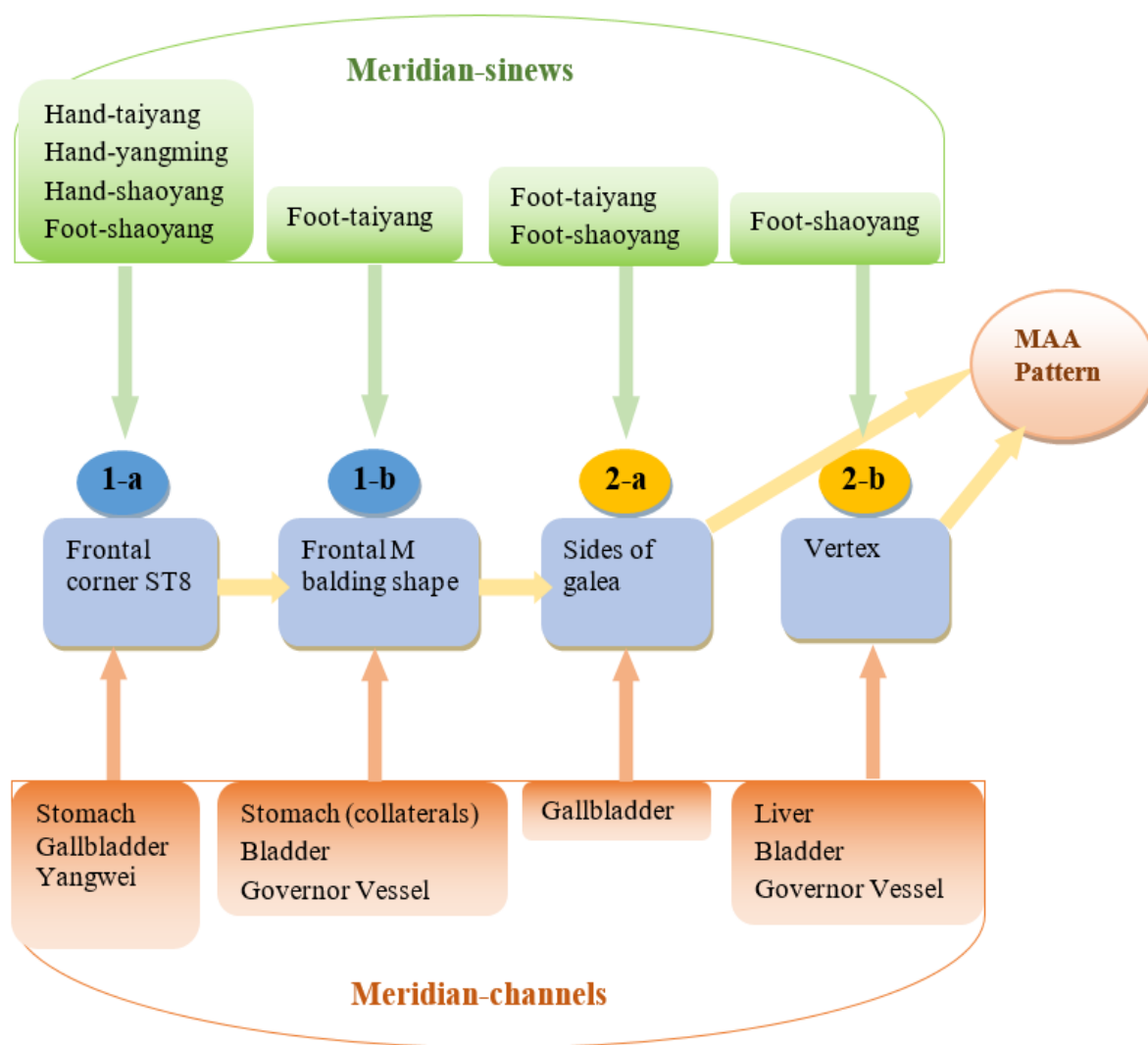


Figure1. Illustration of MMA sequence within meridian system [7]

Table 3. Meridian-sinews and 14 channels appeared in connected regions between genital region and scalp vertex<sup>[7]</sup>.

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, Gallbladder, 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-taiyang	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 hair-line, superiorly connecting the chest and diaphragm, inferiorly penetrating the pelvic base (coccyx), and anteroposteriorly rising into the scalp vertex<sup>[9]</sup>, 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<sup>[10,11]</sup>.

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)<sup>[7]</sup>. 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<sup>[12]</sup>. 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 policy-makers 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 deossify 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<sup>[10]</sup> 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

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the liver and its associated gallbladder channels scatter dampness and divert the counterflow *qi*.

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