

## An exploratory investigation and research on the application of cosmetics and the occurrence of facial spots and allergic reactions

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**Abstract:** The emergence of cosmetics has brought people a beautiful appearance, but it has also brought the trouble and annoyance of facial spots. However, researchers and sellers of cosmetics do not consider cosmetics to be the main cause of increased facial spots. One of the more common explanations is that sun exposure is the main cause of facial spots. It is also tactfully stated that the occurrence of facial spots is related with multiple factors such as endocrine disorders, poor immune function, and poor liver function. These reasons share a common feature: they leave people in a state of confusion over multiple causes, whether they understand or not. This report, by investigating the phenomenon of facial skin spots on 366 female cosmetic users, compares the application time of cosmetics with the incidence of spots, and uses actual cases to illustrate the research on the application of cosmetics and the occurrence of facial spots.

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**Keywords:** Synthesis Cosmetics; Pigmented Spot; Senile Plaque; Allergies; Skin Health; Antiaging Biological Beautiology.

### Introduction

After World War II in the 20th century, with the global economic recovery and the development of science, inspired by the ancient practice of applying animal fats to the skin to make the complexion healthy and radiant, synthetic cosmetics were developed using components such as adhesive additives, lipids, and glycerin, thus giving birth to the era of synthetic cosmetics in the world.

Synthetic cosmetics make people feel that the main component that has a moisturizing effect on the face is glycerin, which contains three hydroxyl groups (-OH<sub>3</sub>). The hydration effect of glycerin absorbs water from the air and keeps the skin moist, which is based on the basic skin care theory, has misled people in the 1980s. The pursuit and popularity of synthetic cosmetics have reached their peak. With the pursuit and popularity of synthetic cosmetics and the temptation of economic benefits, functional cosmetics such as named whitening and anti-wrinkle products have emerged one after another. However, due to the limitations of scientific development and the random addition of different additives and chemical products for the sake of cosmetic functions, the harms brought to cosmetic users have been continuous. As a result, synthetic cosmetics entered a dangerous period at the

end of the 20th century and the beginning of the 21st century.

Due to the harm that cosmetics have brought to some users, some consumers of cosmetics are hesitant about purchasing them, and it has affected the economic development of the cosmetics industry. This study reports a survey on the correlation between the starting age of using synthetic cosmetic bottles and the occurrence of chloasma, age spots and allergies among 366 users in three major cities in China. The aim is to conduct statistical analysis based on the data from the survey to explore and study the potential factors that synthetic cosmetics may cause chloasma, age spots and allergies. The aim is to enable consumers who use cosmetics to understand the relationship between synthetic cosmetics and chloasma, age spots and allergies, and to provide strong data and information for the development prospects of the cosmetics manufacturing industry and the future economic market development of cosmetics.

### Materials and methods

1. Randomly select three major cities in China, namely Tianjin, Beijing and Shanghai, as the survey cities for the total number of cosmetic users in front of the counter.

2. Among the above-mentioned three major cities, randomly select places where different occupations and different groups of people are prone to appear, such as public transportation entrances and exits, bus stops, the entrances and counters of large, medium and small shopping malls, and the entrances and counters of large, medium and small banks, and other public places.

3. A questionnaire survey was conducted; randomly selecting women aged 26 to 50 as the subjects. The survey covered the age at which they started using cosmetics purchased on the market, whether they had ever experienced facial allergies during the application, and whether they currently have pigmented spots or age spots.

4. A 366 women were surveyed in the three major cities. The age range was 28-48 years old, with an

average of 38 years old. The numbers in Tianjin, Beijing and Shanghai were 116, 130 and 120 respectively (for details, see Table -1).

5. The data description of the application of normal distribution in data statistics was expressed as  $(\bar{X} \pm S)$ , and the t-test was used for comparison. A P value < 0.05 was considered statistically significant.

### Results

1. The age and urban distribution of the 366 women surveyed; there are 116 people in Tianjin, aged 29 to 49, with an average age of 39. There are 130 people in Beijing, aged 30 to 49, with an average age of 38.5. There are 130 people in Shanghai, aged 28 to 48, with an average age of 38. (For details, please refer to Table -1.)

Table-1: Age and urban distribution of the 366 women surveyed who used cosmetics on June 2018

| City Name                          |         | Tianjin | Beijing | Shanghai |
|------------------------------------|---------|---------|---------|----------|
| Age of surveyed (Years)            | Range   | 29-49   | 30-49   | 28-48    |
|                                    | Average | 39      | 39.5    | 38       |
| Number of people surveyed (person) |         | 116     | 130     | 120      |

2. The distribution of different ages and ratios of women who began to use cosmetics among the 366 surveyed women:  
A survey of 366 women on the age at which they started using cosmetics revealed that 9.84% of them began using cosmetics at the age of 5 and 51.64% had already started using cosmetics at the age of 13. Only 4.37% of women start using cosmetics at the age of 18. Please refer to Table -2 for details. The ratios of 366 women in the five age groups of 5 years old, 10 years old, 13 years old, 15 years old, and 18 years old who began to use cosmetics are detailed in Figure -1.

Table-2: The starting age for using cosmetics in the three major cities of China, 2018

| Ages(years)                     | 5      | 10     | 13      | 15     | 18     |
|---------------------------------|--------|--------|---------|--------|--------|
| Number of people / total amount | 36/366 | 75/366 | 189/366 | 53/366 | 13/366 |
| Percent                         | 9.84   | 20.49  | 51.64   | 14.48  | 4.37   |

3. The occurrence rates of facial saltiness, age spots and allergic reactions among 366 women of different ages who began to use synthetic cosmetics.

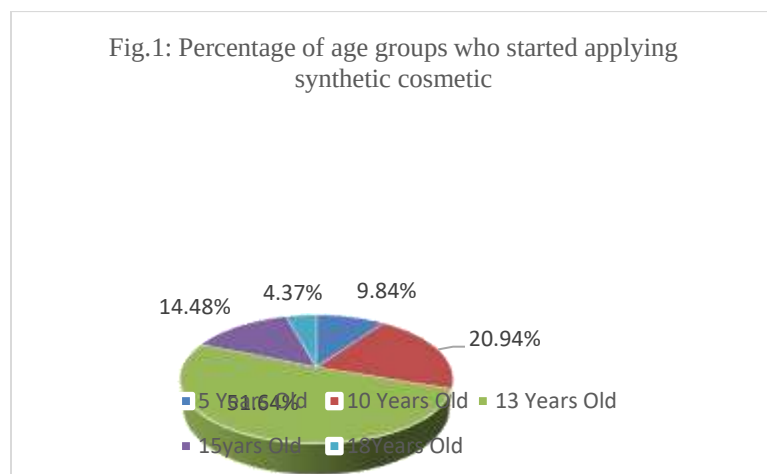
For those who started using synthetic cosmetics at the age of five, the incidences of chloasma, senile spots and allergies were 80.6%, 30.56% and 16.67% respectively. Those who start using synthetic cosmetics at the age of 10. The incidences of chloasma, senile spots and allergies were 80.6%, 30.56% and 16.67% respectively. For those who started using synthetic cosmetics at the age of 10, the incidence rates of chloasma, senile spots and allergies were 75.7%, 29.33% and 14.67% respectively. Those who started using synthetic cosmetics at the age of 13, The incidences of chloasma, senile spots and allergies were 74.6%, 29.1% and 13.23% respectively. For those who started using synthetic cosmetics at the age of 15, the incidence rates of chloasma, senile spots and allergies were 60.38%, 22.6% and 9.43% respectively. Among those who started using synthetic cosmetics at the age of 18, the incidences of chloasma, senile spots and allergies were 46.15%, 15.38% and 7.69% respectively (Table -3).

Table-3: incidence of allergies, pigmented spot &amp; senile plaque from 366 women of different ages in China 2018

| Start Ages | People Surveyed | Pigmented spots |         | Senile plaques |         | Allergic      |         |
|------------|-----------------|-----------------|---------|----------------|---------|---------------|---------|
|            |                 | No. of People   | percent | No. of People  | percent | No. of People | percent |
| 5          | 36              | 29              | 80.6    | 11             | 30.56   | 6             | 16.67   |
| 10         | 75              | 56              | 75.7    | 22             | 29.33   | 11            | 14.67   |
| 13         | 189             | 141             | 74.60   | 55             | 29.10   | 25            | 13.23   |
| 15         | 53              | 32              | 60.38   | 12             | 22.6    | 5             | 9.43    |
| 18         | 13              | 6               | 46.15   | 2              | 15.38   | 1             | 7.69    |

## Discussion

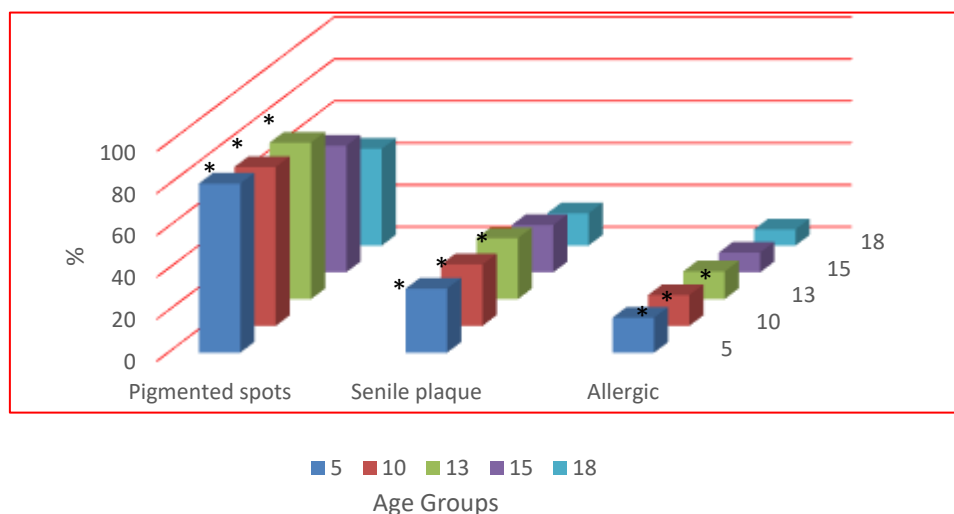
1. The age range for cosmetics application has risen from the traditional 12 years old to the current 5 years old. The "once-in-a-lifetime" experience at marriage: In ancient rural areas, cosmetics were luxury items. Many women only officially put on makeup (apply rouge and powder) on their wedding day throughout their lives. This is more like a ceremony marking the transformation from "girl" to "daughter-in-law". The age for marriage varies in different regions, mostly ranging from 12 to 15 years old. After the liberation of the People's Republic of China, the unified marriage law stipulated that it was 18 years old, which also symbolizes that women start to dress up at the age of 18. Among the 336 cosmetic users surveyed, the earliest age at which they started using cosmetics was only 5 years old. Due to multiple factors of social development, the age at which they began to use cosmetics has advanced from 12 years old to 5 years old today (Figure -1) :



2. The incidence of facial spots and allergies is directly related to the age at which the use of cosmetics begins. The results of the investigation and research show that as the age of starting to use cosmetics becomes younger and younger, the incidence of chloasma, senile spots and allergies is also increasing (Table -3). Moreover, through statistical comparison of the incidence of spots and allergies, it was found that when comparing the age of 5, 10, and 13 with the age of 18 when starting to use cosmetics,  $P < 0.05$  was shown respectively, indicating significant statistical importance (Figure -2). The statistical results of this survey and research data fully demonstrate that there is a considerable difference between the researchers and sellers of cosmetics in their common belief that sun exposure is the main cause of spots. Moreover, the tactful claim that the occurrence of facial spots is related to multiple factors such as endocrine disorders, poor immune function, and poor liver function is even more unfounded. These research data remind people that using less cosmetics and delaying the application age of cosmetics will be the best way and measure to reduce the incidence of facial spots and allergies.

Conclusion: 1. The younger the age at which cosmetics are started to be used, the higher the incidence of chloasma, senile spots and allergies, showing a clear reverse age pattern. 2. The location where chloasma occurs is consistent with the area where there is a lot of cosmetic residue on the face. 3. The formation of spots on the cheekbones and butterfly spots is typical evidence that cosmetics are related with the formation of chloasma.

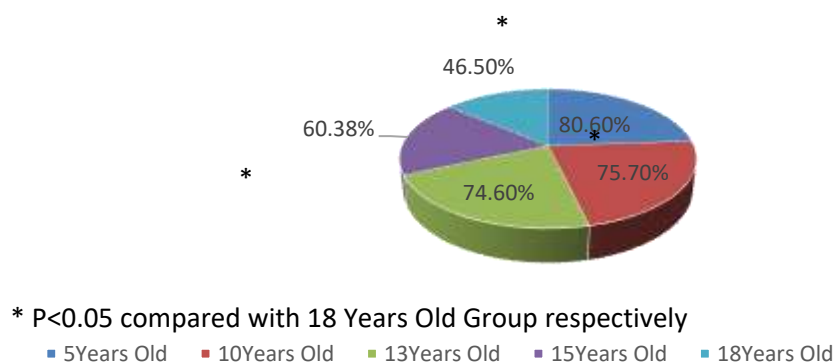
Fig-2. Comparison of rate of allergies, pigmented spots & senile plague from 366 women with different ags in China Mjor city ,2018



\* P< 0.05 compared with 18 Years Old Group respectively

3. Discussion on the Relationship between the Incidence of Chloasma and the occurrence of Cosmetics A review of human life reveals that old age often occurs with increasing age. The data from this survey and research clearly indicate a direct relationship with the application of cosmetics. According to the statistical data, the incidence rates of chloasma among those who started using cosmetics at the ages of 5, 10, and 13 were 80.60%, 75.70%, and 74.60% respectively (Figure -3).

Fig.3:Pigmented spots rate of 5 defferent age groups during applying systhetic cosmetic



\* P<0.05 compared with 18 Years Old Group respectively

4. Discussion on the possible connection between chloasma and cosmetics: The occurrence of chloasma has no clear pattern yet. However, in recent years, the author, based on the theoretical research of the "Anti-Aging Biological Aesthetics" he established, believes that the unobstructed hair and sweat pores in the stratum corneum of the epidermis ensure the intact metabolism of the stratum corneum, that is, the regular metabolism of 30% of the keratinocytes in the stratum corneum every day. It is a necessary metabolic condition for maintaining youthful skin. When using cosmetics, the main components of the cosmetic base are organic substances such as sugars, proteins and fats. After application, it is inevitable that the hair and sweat pores will be blocked to varying degrees. The sebaceous

glands of the hair follicles are blocked to varying degrees. The sebum, mainly composed of lipids, cannot be secreted smoothly to the surface of the skin to form a sebum film. Instead, it remains at the edges of the pores, oxidized by air, and also has photochemical effects, resulting in the formation of chloasma on the skin surface.

5. Discussion on the location of chloasma occurrence and the fact of cosmetic retention; It is well known that chloasma often occurs on the two cheekbones of the face, that is, below the corners of the eyes, and under the eyes, opposite the bridge of the nose, looking like a butterfly. Therefore, chloasma is called butterfly spots (Figure -4). The area on the cheekbones where the butterfly spots form is precisely where the most cosmetics are left on the face. This is typical evidence that cosmetic applications are associated with chloasma.



图-4: 黄褐斑的好发部位

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