

Public Awareness of Blindness Caused by Hyaluronic Acid Injection in China: A Questionnaire Survey

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Background: The occurrence of blindness resulting from facial injection is a catastrophic complication that remains a significant safety concern for patients. The aim was to assess public awareness of blindness caused by hyaluronic acid injection.

Methods: The Tencent questionnaire platform was used to gather self-reported demographic data, information about injection experience, and factors influencing the understanding of blindness. Additionally, we included an educational section on blindness caused by hyaluronic acid injection and evaluated the respondents' intention to undergo injections.

Results: A total of 1000 respondents completed the questionnaire, 15.4% had received filler injections, and 53.7% expressed their consideration of facial filler injections. The majority of respondents (68.3%) reported being aware of the risk of blindness associated with filler injections, with professional health blogs, social media, and news serving as the primary sources of information. Furthermore, 93.4% of the respondents believed that plastic surgeons should discuss the risk of blindness with patients before injection.

Conclusions: The majority of the respondents in this study were aware of the possibility of blindness resulting from filler injections. Health blogs, news outlets, and social media platforms are likely the primary channels through which the public obtains information on this topic. (*Plast Reconstr Surg Glob Open* 2024; 12:e6204; doi: 10.1097/GOX.0000000000006204; Published online 1 October 2024.)

INTRODUCTION

In recent years, facial hyaluronic acid injection has gained popularity as a minimally invasive and nonsurgical rejuvenation option. This treatment offers immediate effectiveness, rapid recovery, and a nonsurgical approach, making it increasingly popular worldwide. A 2018 survey revealed that the number of people in the United States receiving facial injections of hyaluronic acid surpassed 2 million, showing a 2% increase from the previous year.¹⁻³ However, with the increasing number of injections, the incidence of reported complications

risks. Although minor complications like skin ecchymosis, edema, and local pain may occur gradually, facial injections of hyaluronic acid can also lead to more severe complications. An example of such a complication is ophthalmic artery embolization, which can result from intravascular injection and cause vision loss.^{4,5} Unless promptly treated, this complication often leads to irreversible blindness, significantly impacting the patient's psychological well-being and quality of life.⁶ In fact, Kato et al documented 233 cases of facial injection-induced blindness worldwide between 1988 and 2020, with a higher number of cases reported in recent years compared with previous years.⁷⁻⁹ Given the catastrophic and irreversible consequences of ophthalmic artery embolization resulting from facial hyaluronic acid injection, the prevention and treatment of this complication have become significant areas of focus in plastic surgery research.^{3,4,10,11}

Previous studies have underscored the significance of patient education for successful treatment outcomes, which includes providing comprehensive information about treatment options and potential complications.¹² However, there is a dearth of research on public awareness regarding injection-induced blindness, particularly among individuals considering this treatment.

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Due to the rapid advancements in technology and the internet, individuals can readily access the medical information and professional knowledge they require online.¹³ The internet and social media have been proven to be vital tools for plastic surgeons, enabling patient engagement, peer-to-peer education and learning, and outreach to the wider public community.¹⁴ Furthermore, researchers can use the internet to conduct surveys targeting specific populations and focusing on topics of interest.

Given the innovative and rapidly evolving nature of this field, alongside the substantial influence of information on patient perceptions and behavior,¹⁵ this study aimed to evaluate the knowledge and perceptions of laypersons regarding blindness resulting from hyaluronic acid injection. Specifically, our investigation focused on examining how factors such as prior exposure to filler injections and the information sources could influence the viewpoints of individuals contemplating such injections.

METHODS

Survey

Questionnaire Development

This study was approved by the ethics committee of Guangdong Second Provincial General Hospital (2022-KY-KZ-142-01). The survey questions were formulated after conducting an extensive literature review and public interviews. An expert panel, comprising two investigators, a psychologist, a plastic surgeon, and a statistician, assessed the suitability of these questions. Team members completed the survey to gauge its length and determine an appropriate compensation amount before conducting a pilot test involving 20 participants. Following a review for clarity and quality control, the final survey was conducted between May 2, 2022, and April 5, 2023, with a limit of 1000 respondents on the Tencent questionnaire platform. The survey was specifically aimed at respondents on the Tencent questionnaire platform residing in China, and it could be accessed via a computer-based or mobile internet browser. The Tencent questionnaire platform, as an effective questionnaire platform, allows respondents to fill out questionnaires anonymously, and each respondent can only fill out the questionnaire once.

Baseline Data

Each survey began with a series of demographic questions, including age, sex, race, education level, and income. Respondents were restricted from taking the survey multiple times and received a compensation of ¥5 (\$0.73) upon completion.

Previous Filler Injection

Three questions were posed to the respondents concerning their personal experience with filler injections and whether they were acquainted with individuals who had undergone such injections. All respondents were queried about their inclination to undergo filler injections for cosmetic purposes in the future.

Takeaways

Question: The aim was to assess public awareness of blindness caused by hyaluronic acid injection.

Findings: The Tencent questionnaire platform was used to gather self-reported demographic data, information about injection experience, and factors influencing the understanding of blindness.

Meaning: The majority of the general public in China is aware of the possibility of blindness resulting from filler injections.

Previous Knowledge of Blindness Caused by filler injection

Before commencing the survey, respondents were queried about their awareness of blindness resulting from filler injections and the sources from which they obtained this information. Respondents had the option to choose multiple sources, including healthcare professionals, social media, health blogs, news outlets, and friends and/or family.

Factors Influencing Baseline Knowledge on the Association between Filler Injection and Blindness

In addition, respondents were asked to select the current association between blindness and hyaluronic acid injection: strong (understood to be a real risk), unsure, or weak (research suggests an association is unlikely). In addition, respondents were asked to select the factor of most concern when they consider filler injection. Respondents were asked a yes/no question regarding whether plastic surgeons should discuss the risks of blindness with patients considering filler injection. Additionally, if the respondents had received filler injection, they were asked whether the plastic surgeon had informed them of the risk of blindness before injection.

Educational Section

A paragraph on the current knowledge of blindness caused by filler injection drawn from the US Food and Drug Administration and published articles was presented to respondents, and they were assessed for any change in opinion. All respondents were asked a final question regarding any change in the likelihood of receiving filler injections in the future, given the information they were presented with in the survey.

Data Analysis

Statistical analysis was performed using the IBM Statistical Package for the Social Sciences (SPSS) version 22 (IBM, Armonk, N.Y.). Pearson chi-square test or Mann-Whitney U test was used for comparison.

RESULTS

Baseline Characteristics

This study involved 1000 participants who completed the questionnaire, comprising 325 men and 675 women. The questionnaire took an average of 4.45 minutes to

complete. The respondents had an average age of 39.78 and were primarily of Han Chinese ethnicity. The majority (61.3%) had attained at least a bachelor's degree, and their average monthly income fell within the range of ¥5000–20,000 (\$727–2909). The baseline characteristics of the participants are summarized in Table 1.

Previous Experience of Filler Injection

Many respondents had some degree of exposure to filler injection. Table 2 summarizes respondents' previous experience of filler injection through personal experience (15.4%) or knowledge of at least one person

Table 1. Demographics

Characteristic	Value
Mean age ± SD, y	39.78 ± 13.23
Ethnic group	
Han	934 (93.4%)
Zhuang	8 (0.8%)
Manchu	9 (0.9%)
Others	49 (4.9%)
Highest level of schooling	
Junior high	25 (2.5%)
High school	104 (10.4%)
Some college	258 (25.8%)
Bachelor's degree	516 (51.6%)
Master's degree	90 (9.0%)
Doctorate	7 (0.7%)
Average monthly personal income	
<¥5000	477 (47.7%)
¥5000–¥10,000	358 (35.8%)
¥10,000–¥20,000	121 (12.1%)
>¥20,000	42 (4.2%)

Table 2. Respondent Exposure to Facial Hyaluronic Acid Injection

Question	No. (%)
Have you received hyaluronic acid injection?	
Yes	154 (15.4%)
No	846 (84.6%)
Do you know anyone received hyaluronic acid injection?	
Yes	513 (51.3%)
No	487 (48.7%)
Would you consider receiving hyaluronic acid injection?	
Yes	537 (53.7%)
No	463 (46.3%)

Table 3. Respondent Exposure to Filler Affects Willingness to Receive Injection

	Yes	No	<i>P</i>
Respondent had received filler injection	104	50	
Respondent had not received filler injection	433	413	<0.001
Respondent know someone received injection	243	126	
Respondent does not know someone received injection	294	337	<0.001
Respondent have heard of blindness	182	190	
Respondent never heard of blindness	331	297	=0.247

who received filler injection (51.3%). More than 50% of respondents would consider receiving filler injection in the future for cosmetic purposes. Table 3 further details the effect of having personal experience with filler injection or knowing someone who had received filler injection in considering future filler injection. Both groups were significantly more willing to receive filler injection in the future than those who had no filler experience ($P < 0.001$). Interestingly, there is no difference in whether the respondents have heard the risk of blindness.

Previous Knowledge of Blindness Caused by Filler Injection

Before receiving the information presented in the survey, 68.3% of all respondents had previously heard about blindness. The respondents who had received filler injection knew more about blindness than those who had no injection experience ($P < 0.005$; Table 4). Respondents who had previously heard of blindness or who had received filler injection or know someone who received filler injection were more likely to understand the association between blindness and filler injection as detailed in Table 5.

Informed Consent Regarding Blindness

Over 90% of the respondents believe that plastic surgeons should talk with patients about the risk of blindness before injection. Among the respondents who had received filler injection, 37% of the respondents said the plastic surgeon did not inform them of the risk of blindness (Table 6).

The Willingness to Receive Injection after Education

After all the information presented in the survey, 10.7% of the respondents would be more likely to receive injection and approximately 60% of respondents reported they would be less likely to receive filler injection. The respondents who had filler injection experience would be more likely to receive injection compared with the respondents without injection experience ($P < 0.01$; Table 7).

DISCUSSION

Facial injection blindness or visual impairment is one of the most serious complications of hyaluronic acid injection and is often irreversible. Its pathogenesis is the entrance of hyaluronic acid into the ophthalmic artery during injection, which causes embolization of the central retinal artery, leading to the ischemic necrosis of the retina and, thus, blindness (visual impairment).^{16–18}

Table 4. Previous Knowledge of Blindness Caused by Filler Injection

Question	With Injection Experience	Without Injection Experience	Total
Never heard of it	37(24.0%)	280(33.1%)	317(31.7%)
Have heard of it	117(76.0%)	566(66.9%)	683(68.3%)

Table 5. Factors Influencing Baseline Knowledge on the Association Between Filler Injection and Blindness

	Strong (Known to Be a Risk) (%)	Unsure (%)	Weak (Not a Known Risk) (%)	P
Respondent had received filler injection	27 (17.5)	88 (57.1)	39 (25.4)	
Respondent hadn't received filler injection	83 (9.8)	681 (80.5)	82 (9.7)	<0.01
Respondent know someone received injection	62 (12.1)	365 (71.3)	85 (16.6)	
Respondent does not know someone received injection	48 (9.8)	403 (82.6)	37 (7.6)	<0.01
Respondent have heard of blindness	83 (12.2)	507 (74.2)	93 (13.6)	
Respondent never heard of blindness	27 (8.5)	262 (82.6)	28 (8.9)	<0.05

Table 6. Informed Consent Regarding Complication

Question	No. (%)
Should plastic surgeons talk with patients about the risk of blindness before injection?	
Yes	934 (93.4%)
No	66 (6.6%)
Did the plastic surgeons informed you about the risks of blindness before injection?	
Yes	97 (63.0%)
No	57 (37.0%)

Table 7. Respondent Preferences following Blindness Education

Preference	With Injection Experience	Without Injection Experience	Total
Yes, more likely to receive injection	49 (31.8%)	58 (6.9%)	107 (10.7%)
Yes, less likely to receive injection	67 (43.5%)	515 (60.9%)	582 (58.2%)
Unchanged	38 (24.7%)	273 (32.2%)	311 (31.1%)

This is the first study on the layperson’s basic knowledge and awareness of blindness caused by facial hyaluronic acid injection. Despite an increasing number of reports of complications due to hyaluronic acid injection, only 68.3% of the laypeople had heard of this serious complication. Our findings can help surgeons manage cosmetic injections in current and future patients and guide forthcoming public education on hyaluronic acid injection.

A survey by Varajini in the United Kingdom showed that 85% of British ophthalmologists and oculoplastic surgeons are well aware of the risk of blindness caused by filler injection,¹⁹ and this is the first study that uses a questionnaire survey to obtain the layperson’s perspective on the risk of this complication. The majority of respondents (68.3%) had previously heard about blindness (Table 4). Our findings suggest that professional health blogs, social media, and news may be the most effective way to spread knowledge, particularly to those who are not in direct contact with health care professionals (Fig. 1).

Safety is the most concerning factor when patients consider filler injection, (Fig. 2) and over 90% of the respondents believe that the doctor should inform patients of the risk before the injection, but only 63% of the respondents were informed of the risk of blindness before they received

injection. (Table 6) The results of our survey showed that the percentage of respondents with facial injection experience who correctly knew about this complication was higher than that of those without such experience, suggesting that some doctors had provided information about this complication before performing facial hyaluronic acid injection (Table 5). It is incumbent on plastic surgeons to raise awareness about this condition among both existing and prospective patients.

In the era of the 21st century, known as the age of information, social media exerts the most significant influence on plastic surgery compared with other clinical departments. Prior research has demonstrated that a notable portion of individuals pursue cosmetic surgery due to the impact of social media, which significantly influences their decision-making process regarding surgical procedures.^{20,21} The findings of this study further underscored the influence of social media, as the majority of individuals initially became aware of this complication through social media platforms. Plastic surgeons can utilize social media platforms not only for patient education and personal branding but also for disseminating scientific knowledge to the general public. According to social scientists, individuals often struggle to comprehend the risks associated with rare events, either overemphasizing or completely disregarding

Sources of Prior Knowledge of Blindness

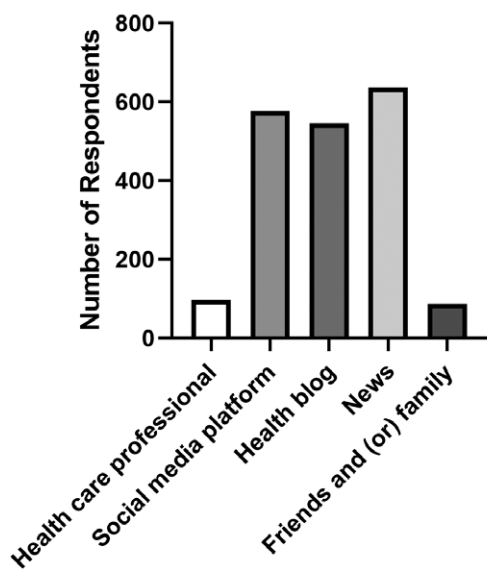


Fig. 1. The source of information about blindness.

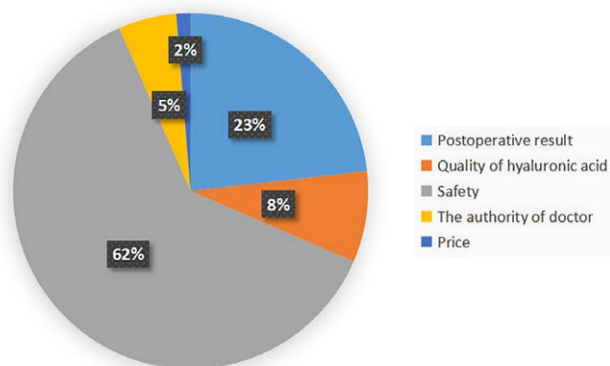


Fig. 2. The most concerning factor for facial filler injection.

them.²² However, it is important to note that studies have revealed the presence of misleading information on social media, as some messages are disseminated by individuals without medical expertise. Hence, it is believed that a more authoritative approach to public awareness, regarding this complication, would yield better outcomes. Professional organizations and plastic surgeons should prioritize efforts to enhance public awareness of this complication.

Following the scientific popularization of blindness caused by facial hyaluronic acid injection, nearly 60% of the respondents indicated that their willingness to receive facial hyaluronic acid injection decreased. Clearly, this proportion of respondents made such a choice out of concern for the safety of facial hyaluronic acid injection, which was also one of the reasons why some doctors did not obtain informed consent associated with this complication before performing facial hyaluronic acid injection. However, a qualified doctor should follow relevant operation specifications. In addition, according to the results of a previous study,²³ the motivation for facial cosmetic surgery was significantly related to the patient's self-confidence and self-approval. Table 8 shows the correlation among baseline characteristics of the participants and the awareness of the risks of hyaluronic acid injections. By using univariate analysis, a significant correlation was found for the age and education level ($P < 0.001$). Besides, younger respondents showed better awareness about the risks of hyaluronic acid injections compared with the older (age >40). Multivariate analysis by logistic regression confirmed the age-independent role of awareness about the risks of hyaluronic acid injections (Table 9).

Although the participants in this survey were from across the country, there are still some limitations in this study. The pilot study included only 20 respondents, and more participants included could make the study more convincing. The sample size was insufficient; 1000 respondents participated in this study, and a larger sample size can produce more convincing results. Due to the imbalance of regional economic development, the public awareness and acceptance of hyaluronic

Table 8. Univariate Analysis of Variables Correlated to the Awareness of the Risks of Hyaluronic Acid Injections

	Never Heard of It	Have Heard of It	Univariate <i>P</i>
Age (y)			
18–40	219	651	<0.001
>40	98	32	
Education			
Junior high	24	1	<0.001
High school	75	29	
Some college	120	138	
Bachelor's degree	52	464	
Master's degree	43	47	
Doctorate	3	4	
Income per month			
<¥5000	220	257	0.09
¥5000–¥10,000	42	316	
¥10,000–¥20,000	20	101	
>¥20,000	35	7	

Table 9. Multivariate Analysis of Variables Correlated to the Awareness of the Risks of Hyaluronic Acid Injections

	OR (95% CI)	P
Age (y)		
18-40 (N = 651)	1.00	0.04
>40 (N = 32)	4.61 (0.83–25.60)	
Education		
Junior high (N = 1)	1.00	
High school (N = 29)	1.80 (0.25–12.78)	
Some college (N = 138)	1.68 (0.25–11.08)	0.83
Bachelor's degree (N = 464)	6.76 (0.84–54.80)	
Master's degree (N = 47)	1.73 (0.26–11.82)	
Doctorate (N = 4)	2.31 (0.43–10.61)	

acid varies, but this study did not discuss the respondents in groups by different regions. All survey-based studies are limited by the level of honesty of the respondents in answering questions. In addition, media coverage in this area is increasing; therefore, public knowledge and views on this complication will continue to change over time, which will alter the validity of our findings.

CONCLUSIONS

A great number of laypeople, have heard of the occurrence of blindness resulting from filler injections. Health blogs authored by medical professionals, news reports, and social media platforms are likely to be among the primary channels through which the public will acquire knowledge in this field, going forward. As medical professionals and official associations, it is crucial for us to not only enhance accurate knowledge about this complication but also ensure the prompt and effective dissemination of this information to both current and future patients.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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