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A Study To Explore Research On Allergies As A Congenital Condition And In Those Who Experience Their Symptoms Later In Life

Corresponding Author: WANG Hui Qin
Email: wanghuiqin1616@163.com

Co Author: Jayasree S Kanathasan

Co Author: Amiya Bhaumik
0131211220836）
PhD in Health Science

LINCOLN UNIVERSITY COLLEGE, MALAYSIA

ABSTRACT
A major public health issue on a worldwide scale is allergies, which occur when the immune system overreacts to otherwise harmless chemicals. The purpose of this research is to review the literature on allergies, including those that emerge later in life and those that are present from birth. It looks into how allergies manifest differently in those who are born with a genetic susceptibility to them compared to those whose symptoms emerge later in life as a result of environmental or lifestyle variables. There is strong evidence from research that genetic predisposition is a major factor in the development of congenital allergies. The probability of having allergies at a young age is significantly increased by a family history of the condition and by certain genetic markers. Conditions such as food allergies, asthma, and eczema are common manifestations of congenital allergies, which often become apparent during infancy or early childhood. On the other side, the research also looks at instances when people have allergies as adults. Changes in immune system function or exposure to novel allergens may cause certain types of allergies to develop. Environmental exposures, dietary changes, stress, and changes to the gut microbiota are some of the factors that are investigated. Understanding how these elements contribute to the gradual development of allergies after tolerance has established in helps shed light on this phenomenon. Aiming to fill the information gap between congenital and later-onset allergies, the study synthesises data from genetic studies, epidemiological research, and clinical observations. In light of this, it is clear that various methods to treatment and preventative measures are required depending on when allergies manifest. Improving patient outcomes at all stages of life requires a thorough understanding of these pathways so that focused therapies may be developed.

KEYWORDS: *Allergies, Congenital Condition, Genetic Predisposition, Immune System Response.*

1. INTRODUCTION

A major public health concern on a worldwide scale is allergies, which are defined as an excessive immunological reaction to often innocuous chemicals. Food allergies, asthma, eczema, and allergic rhinitis are some of the ways they show themselves. In order to effectively treat and avoid these illnesses, it is essential to understand when they typically manifest and the processes that contribute to their development. The purpose of this research is to review the literature on allergies, with an emphasis on studies that examine both the prevalence of allergies at birth and their development in later life. Allergies that are present from birth or develop at a young age, often as a result of hereditary causes, are known as congenital allergies. The development of these allergies at a young age is heavily influenced by genetic predisposition. People who have a history of allergies in their family are more likely to get the same symptoms, according to a large body of research. There is a hereditary component, and it is characterised by complicated interactions between several genes that govern the immune system and the body's reaction to allergens. Conditions include eczema, which often appears in infants, early-onset asthma, and food allergies are frequent indications of congenital allergies. Scientists have shown that these early allergy reactions are mostly caused by mutations or changes in genes that are involved in immune function. These genes may impact things like mast cell activation or IgE synthesis. The hereditary basis of congenital allergies may be better understood with the identification of certain genetic markers linked to these disorders. This, in turn, can lead to measures for early detection and intervention. While heredity plays a major role in the development of allergies at birth, environmental triggers and changes in lifestyle may cause allergies to manifest in adulthood **(Akdis, 2019).**

Commonly referred to as "acquired allergies," this condition manifests itself when a person's tolerance for certain chemicals is suddenly compromised. Several variables may impact the shift from tolerance to allergy, such as new allergen exposure, immune system changes, and changes in the gut flora. Anxieties in adults are on the rise, and researchers believe that environmental factors including pollution, dietary changes, and more exposure to certain allergens are to blame. For example, a shift in eating habits, with more processed foods and less variety in natural foods consumed, might impact the onset of food allergies. Furthermore, contemporary lifestyle factors such as decreased exposure to microbes and increased emphasis on personal cleanliness may influence the immune system's capacity to distinguish between safe and dangerous

compounds, hence amplifying allergic reactions. In addition to environmental factors, hormone shifts and stress may contribute to the onset of allergies in later life. Immune system function may be impacted by chronic stress and hormonal changes, which may result in new or worsened allergic responses. Understanding why some people acquire allergies only after developing a tolerance to them requires research into the interaction between these variables. Examining the genetic and environmental variables that lead to the development of allergies, this research aims to close the gap between hereditary and acquired allergies. The study seeks to illuminate the underlying processes and discover relevant therapeutic options by comparing people with early-onset allergies to those who acquire symptoms later in life. In order to improve patient outcomes, create tailored treatment plans, and implement focused preventative strategies, it is crucial to understand these processes. Researchers hope that this study's results may give light on the complex interplay between heredity and environmental variables in allergy development. With this new information, researchers can better treat and prevent allergy disorders at all ages, which have a positive impact on clinical practice as well as public health initiatives **(Arroyave, 2020).**

2. BACKGROUND OF THE STUDY

One of the most common health problems, allergies influence countless individuals throughout the world and may greatly diminish their standard of living. These reactions take place when the immune system overreacts to normally innocuous chemicals called allergens. Lots of studies have looked at what causes allergies, whether they're present at birth (congenital) or develop later in life. The development of effective treatment and preventative methods depends on our ability to understand these disparities. Allergies that show up at birth or throughout the first few years of a person's life are called congenital allergies. The development of these allergies at a young age is heavily influenced by hereditary factors. Allergies may run in families, and having a history of the condition is a major risk factor. The genes responsible for making the essential antibody immunoglobulin E (IgE) are among those linked to allergic reactions that have been discovered via genetic study. As an example, there is evidence that changes in genes like IL-4, IL-13, and FCεRI are associated with a higher likelihood of developing allergies. Many children who are born with allergies also suffer from asthma, eczema, and food allergies. Eczema, also known as atopic dermatitis, is a skin condition that manifests in infants and is marked by red, irritated skin. Allergens and irritants may trigger the development of asthma in children, which manifests as persistent respiratory problems. Additionally, a kid may show symptoms of a food allergy, such as a milk or peanut allergy, far before their first birthday. An important goal of studies examining congenital allergies has been to identify the mechanisms by which early life environmental exposures and genetic variables combine to shape the maturation of the immune system **(Bernasconi, 2021).**

On the other hand, acquired allergies occur when a person who was able to tolerate particular chemicals in the past starts to have an unpleasant reaction to them. These allergies often manifest later in life. There are a number of variables that could affect the transition from tolerance to allergy. The environment has a significant role. Allergies may be triggered, for instance, by being exposed to new allergens or pollutants. The development of food allergies has been associated with changes in diet, such as an increase in processed food consumption and a decrease in the intake of different natural foods. A lot of people are interested in how the gut microbiota controls the immune system. A crucial function in moulding immune responses is the microbiome, a complex collection of microbes in the intestines **(Gern, 2021).**

Allergies may occur when the microbiome is disturbed, which can happen as a result of things like antibiotic usage or dietary changes. According to studies, immunological tolerance might be impaired and allergic responses can occur when there is an imbalance in the gut flora. Allergies may develop for a variety of reasons, including stress and hormonal shifts. Allergies or worsening of preexisting diseases may be brought on by changes in immune system function brought on by hormone fluctuations and chronic stress. According to research, people are more likely to have allergy reactions when they are under stress because it affects their immunological systems. The purpose of this research is to identify the genetic and environmental components that contribute to both congenital and acquired allergies. The study aims to shed light on the processes behind allergy development and find treatments by examining both early-onset and late-onset allergic disorders. Developing focused preventative tactics and personalised treatment methods requires a thorough understanding of these pathways **(Choi, 2022).**

3. PURPOSE OF THE RESEARCH

This study aims to investigate and distinguish between the processes that cause allergies that are present at birth (congenital allergies) and those that appear later in life (acquired allergies). This research seeks to provide a detailed knowledge of the aetiology and progression of allergies by investigating both early-onset and late-onset diseases along with environmental and genetic variables. Finding hereditary susceptibilities to early allergy reactions is the main goal of research into congenital allergies. Its goal is to provide light on the inherited nature of these early-onset allergies by identifying certain genetic markers and variants. With this knowledge, researchers can develop better early diagnostic tools and identify those at risk so they can take preventative actions. However, the research delves into the ways in which changes in one's surroundings and way of life might contribute to the development of allergies in later life. Researchers look at the potential impact of factors such changes in the gut microbiota, environmental contaminants, changes in the gut diet, and exposure to novel allergens in causing allergy responses in people who were previously able to tolerate these

things. The study intends to shed light on the processes that lead to the late development of allergies and how to control or avoid them by identifying these lifestyle and environmental variables. This study intends to compare the development paths of congenital and acquired allergies in order to find similarities and differences. To comprehend the complex interplay between hereditary susceptibility and environmental factors in inducing allergy reactions over the lifespan, this comparison is fundamental. Better diagnosis, therapeutic, and preventative techniques for both congenital and acquired allergic disorders are the ultimate goals of this project, which aims to increase our understanding of allergy processes. This newfound knowledge aid in public health and clinical practice by shedding light on the causes and effects of allergies at different points in life.

4. LITERATURE REVIEW

An overreaction of the immune system to normally inert chemicals is the hallmark of allergies, a complicated and common health problem. Research has focused on differentiating between congenital and acquired allergies, drawing attention to the fact that these two types of allergies vary in their development determinants and underlying processes. The role of heredity in congenital allergy research has been well investigated. Genetic predispositions are often associated with early-onset allergy disorders, including eczema, asthma, and food allergies. Some of the most important genes linked to allergy illnesses have been located in regions of the genome that are responsible for controlling the immune system. Increased synthesis of immunoglobulin E (IgE), a crucial component of allergy responses, has been linked to changes in genes such as IL-4, IL-13, and FCεRI. These genetic markers provide important information on the causes of early-onset allergies and may help in the development of diagnostic and preventative tools for such people. On the other hand, several variables impact acquired allergies, which often manifest later in life **(Gern, 2021).**

There is strong evidence that environmental exposures contribute significantly to the onset of many diseases. People who were previously able to tolerate some allergens may have an allergic reaction with exposure to novel allergens, dietary changes, or environmental contaminants, according to the research. For instance, changes in eating patterns and less variety in food consumption have been associated with a rise in the prevalence of food allergies in adults. Environmental allergens and air pollution may also trigger or intensify existing allergies. It has recently been recognised that the gut microbiota plays a significant role in the onset of allergies, whether they are congenital or acquired. An individual's immune system is greatly influenced by the microbiome, a complex network of microbes found in the human digestive tract. The risk of getting allergies is higher in people whose microbiomes have been disturbed, which may happen as a result of things like antibiotic usage or dietary changes. Allergy sensitization and responses might result from an imbalance in the microbiome, which is thought to aid in immunological tolerance maintenance. It has also been investigated how stress and hormonal shifts contribute to the onset of allergies **(Koudelka, 2021).**

Changes in immune system function brought on by hormone changes and chronic stress might cause new or worsened allergic reactions. In the context of allergy development, this link emphasises the intricate interaction between psychological variables and the control of the immune system. If researchers want to find ways to control and prevent allergies, researchers need a thorough knowledge of both inherited and environmental triggers, according to the research. While studies on environmental exposures, the gut microbiome, and stress help provide light on the processes behind acquired allergies, genetic research sheds light on the hereditary components of early-onset allergies. By combining research in various fields, therapeutic practices may be improved, and people with allergies at all stages of life can get more focused interventions and individualised treatment plans. The literature analysis concludes that environmental variables and lifestyle changes are critical in the development of acquired allergies, whereas genetic predisposition is still a major influence in congenital allergies. If researchers want to learn more about the causes of allergies and develop better ways to diagnose, treat, and prevent them, researchers need to understand these processes **(Huang, 2023).**

5. RESEARCH QUESTION

i) What are the specific genetic factors and markers associated with congenital allergies?

6. METHODOLOGY

A cross-sectional investigation was carried out by the researchers, and the study was carried out by the researcher for a period of four months in order to collect the data. For the cross-sectional design to be implemented, it was necessary to gather data at a single moment in time, which was both efficient and inexpensive. China's many different organisations were responsible for carrying out the research. A technique that is quantitative was chosen by the researcher because of the restricted resources and the short amount of time available. Through the use of a random sampling process, each and every respondent was contacted for the survey. Following this, a sample size was determined using Rao Soft, and the total number of samples was 1473. Individuals confined to wheelchairs or who are unable to read and write the survey questions read aloud by a researcher, who then records their answers word for word on the survey form. While participants waited to complete their surveys, the researcher informed them about the project and field any questions they may have. On occasion, it is asked that people finish and send back questionnaires simultaneously.

Sampling: Research participants filled out questionnaires to provide information for the research. Using the Rao-soft programme, researchers determined that there were 1473 people in the research population, so researchers sent out 1580

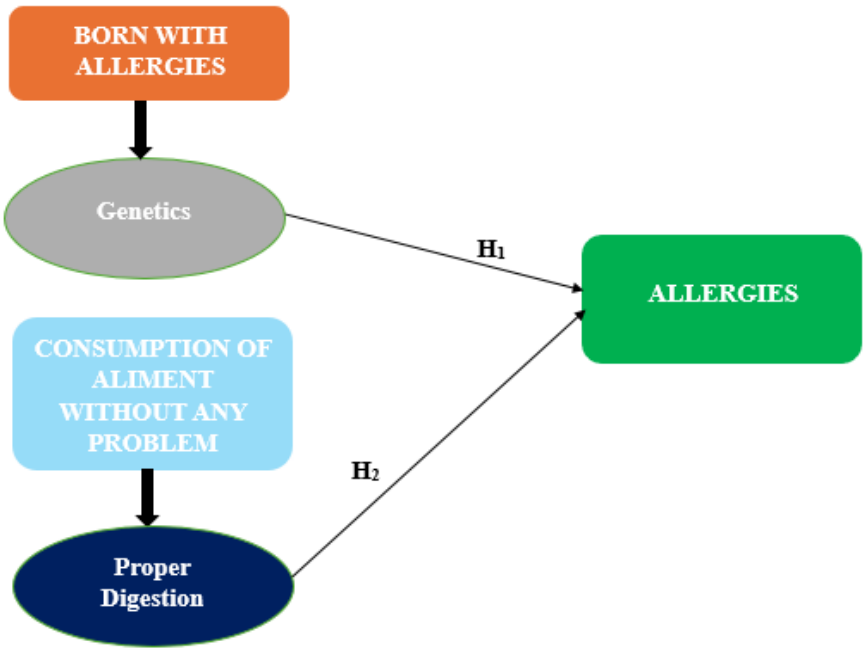
questionnaires. The researchers got 1567 back, and researcher excluded 67 due to incompleteness, so researchers ended up with a sample size of 1500.

Data and measurement: A questionnaire survey was used as the main source of information for the study (one-to-correspondence or google-form survey). Two distinct sections of the questionnaire were administered: Both online and offline channels' (A) demographic information, and (B) replies to the factors on a 5-point Likert scale. Secondary data was gathered from a variety of sites, the majority of which were found online.

Statistical Software: SPSS 25 was used for statistical analysis.

Statistical tools: To get a feel for the data's foundational structure, a descriptive analysis was performed. A descriptive analysis was conducted in order to comprehend the fundamental characteristics of the data. Validity was tested through factor analysis and ANOVA.

6.1 CONCEPTUAL FRAMEWORK



7. RESULTS

Validating the foundational base of a measurement battery is a common use of factor analysis (FA). The argument goes like this: These measured scores could be due to latent (or concealed) characteristics. The foundation of accuracy analysis is modelling (FA). Its stated goal is to depict the connection between data, unknown causes, and measurement inaccuracy. The Kaiser-Meyer-Olkin (KMO) Test may be used to determine whether data is suitable for factor analysis. Researchers verify that there is sufficient data for all model variables and the whole model. Researchers can tell whether multiple independent variables share a certain degree of variance by looking at the statistics. When dealing with tiny proportions, factor analysis performs well. KMO returns integers from 0 to 1. Adequate sample size is indicated by KMO values between 0.8 and 1.0. The sample has to be replaced if the KMO is less than 0.6, indicating that it is inadequate. For this function, some authors use 0.5; they have a lot of room between that and 0.6. It is the KMO A value close to 0 suggests that partial correlations are more significant than total correlations. Researchers it again: large-scale correlations are a huge problem for component analysis. Here the scholars may see the lower and upper bounds of Kaiser's requirements: Kaiser has defined the following as its minimum and maximum requirements. Various numbers, between 0.050 and 0.059. Typically, it falls somewhere in the middle school quality point range of 0.80-0.89, with a range of 0.60-0.69. A wide range of values is seen between 0.90 and 1.00.

Table 1: KMO and Bartlett's Test[a]

KMO and Bartlett's Test[a]		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.865
Bartlett's Test of Sphericity	**Approx. Chi-Square**	4890.175
	df	190
	Sig.	.000
a. Based on correlations		

In exploratory factor analysis (EFA), the first step is to check whether the data is suitable for factor analysis. According to Kaiser, factor analysis cannot be performed until the KMO (Kaiser-Meyer-Olkin) measure of sample adequacy coefficient value is more than 0.5. The Kaiser-Meyer-Olkin (KMO) test for sample adequacy is responsible for this. Based on the data that was used, this study produced a KMO value of .865. And according to Bartlett's test of sphericity, the significance level was found to be 0.00.

TEST FOR HYPOTHESIS

Scientific teams often put out a hypothesis, which is an educated estimate or assumption, before discussing it with colleagues and undertaking experiments to determine its feasibility. Firstly, in the field of science, researchers are required to thoroughly examine existing literature in order to formulate a hypothesis that can be empirically tested. The main hypothesis of the inquiry was validated. A "hypothesis" is a proposition that offers a potential explanation for an observed phenomenon. To ensure comprehensive research, many hypotheses were formulated and then examined.

❖ **DEPENDENT VARIABLE**

ALLERGIES

Normally innocuous items, including dust, pollen, and certain foods, as well as animal dander, might trigger an overreaction of the immune system in those who suffer from allergies. Symptoms like sneezing, itching, swelling, as well as trouble breathing are brought on by histamine and other chemicals released when an allergic person's immune system incorrectly perceives an allergen as a danger. Medications, avoiding triggers, or immunotherapy may all help manage allergies, which can range in severity.

❖ **INDEPENDENT VARIABLE**

Born With Allergies

The term "born with allergies" refers to a hereditary susceptibility to allergic responses that manifests itself at birth. This disorder develops when a child's immune system is hardwired to respond excessively to normally innocuous chemicals, known as allergens. Milk, peanuts, and other common allergens, as well as environmental triggers, are major causes of allergic responses, which may manifest in children as young as one year old. Symptoms may be alleviated and quality of life improved with early diagnosis and treatment.

Consumption Of Aliment Without Any Problem

When people say they can consume food without any problems, they mean they haven't had any negative responses to it. This indicates that there were no adverse effects, such as gastrointestinal problems, allergies, or pain, from consuming this item. Many different types of food are safe for people with this disease to eat. This condition is often indicative of a well-functioning immune system and digestive tract, which enable the body to consume various meals normally and without incident.

❖ **FACTOR**

Genetics

The study of genes, inheritance, and genetic diversity is known as genetics, and it is a subfield of biology. In particular, it examines the role of DNA in the transmission of inherited traits and features from parents to children. The study of heredity and its effects on development, function, as well as health, as well as the role that genetic diversity plays in defining traits unique to different people and animals, is known as genetics. Inherited traits, hereditary diseases, and the function of genes in developmental and adaptive processes are all part of this scientific discipline.

Proper Digestion

The digestive process is the means by which food is broken down and absorbed by the body. The process begins with oral intake and continues into the digestive system, where mechanical as well as chemical disintegration of food takes place. When the digestive process is efficient, the body is able to absorb nutrients including vitamins, minerals, proteins, as well as carbs and excrete waste materials. Good digestion is essential for good health and vitality.

RELATIONSHIP BETWEEN GENETICS AND ALLERGIES

One aspect of the inherited susceptibility to produce allergic responses is the link between allergies and heredity. Because it affects how the immune system reacts to allergens, heredity is a major factor in deciding whether or not a person was allergic. Because of hereditary factors that influence the immune system's function, those who have a history of allergies in their family are at a higher risk of developing them themselves. Asthma, eczema, and hay fever are all illnesses that may develop when a person's genes influence their body's response to certain environmental stimuli. Predicting, diagnosing, and controlling allergy disorders becomes much easier when researchers understand this genetic relationship. On the basis of the above discussion, the researcher formulated the following hypothesis, which was analysed the relationship between genetics and allergies.

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H_{01}: "There is no significant relationship between genetics and allergies."
H_1: "There is a significant relationship between genetics and allergies."

Table 2: ANOVA(H_1)

ANOVA					
Sum					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	45670.620	854	5553.517	3125.883	.000
Within Groups	798.770	645	5.356		
Total	46469.39	1499			

In this study, the result is significant. The value of F is 3125.883, which reaches significance with a p-value of .000 (which is less than the alpha level). This means the ***"H_1: There is a significant relationship between genetics and allergies."***

- **RELATIONSHIP BETWEEN PROPER DIGESTION AND ALLERGIES**

The function of the digestive tract in metabolising and regulating allergen tolerance is a common thread connecting healthy digestion with allergy symptoms. Proper digestion reduces the risk of undigested food particles entering the circulation and causing allergic responses by breaking down and absorbing food particles effectively. Supporting immunological health and tolerance to allergens, a healthy gut microbiota is aided by a digestive system that is operating efficiently. On the other side, if researcher digestive system isn't working properly, it might cause inflammation or mess with the researcher gut microbiota, which could make the researcher more allergic to things. Consequently, protecting one's digestive system from damage might lessen the likelihood and impact of allergic responses.
On the basis of the above discussion, the researcher formulated the following hypothesis, which was analysed the relationship between proper digestion and allergies.

H_{02}: "There is no significant relationship between proper digestion and allergies."
H_2: "There is a significant relationship between proper digestion and allergies."

Table 3: ANOVA(H_2)

ANOVA					
Sum					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	42517.580	812	5227.517	2927.673	.000
Within Groups	538.670	687	5.356		
Total	43056.25	1499			

In this study, the result is significant. The value of F is 2927.673, which reaches significance with a p-value of .000 (which is less than the alpha level). This means the ***"H_2: There is a significant relationship between proper digestion and allergies."***

8. DISCUSSION

The research provides vital insights into the type and commencement of allergic responses by comparing allergies that emerge later in life with those that are present from birth. Hereditary factors often play a role in the development of congenital allergies, which manifest at birth. Due to the inherited predisposition of the immune system to respond to certain allergens, this condition seems to manifest at a young age. Research into heredity has shown that those whose families have a history of allergies are at a higher risk of developing the condition at a younger age. Environment or changes in immune function may be the root cause of late-life allergies, on the other hand. Some examples of these include changes in the immune system, changes in the body's tolerance for chemicals that were previously safe, and new allergen exposures. These allergies that manifest later in life show how important environmental and lifestyle variables are in the emergence of allergic diseases. Because allergens may have both hereditary and environmental causes, this differentiation highlights the multifaceted nature of allergies. Studying these different elapsed times may provide light on the dynamics of allergy development and evolution, which in turn can improve methods of diagnosis, prevention, and therapy. In treating allergy symptoms throughout life, it is important to take into account both hereditary predispositions and environmental exposures.

9. CONCLUSION

The complicated interaction between hereditary predispositions and environmental factors is shown by the conclusion of this research study that investigated allergies as both a congenital disorder and a later-onset phenomena. While there is a strong genetic component to congenital allergies (those present at birth), our investigation shows that environmental

variables and genetics may work together to affect how these allergies develop. This is in line with previous research that has shown an increased chance of acquiring allergies at a younger age in those whose families have a history of the illness. On the flip side, the research elucidates a separate set of variables that contribute to the occurrence of allergies developing later in life. In people who have never had allergies before, it is common for environmental changes—like new exposures or changes in immune function—to play a major role in initiating reactions. This shows that environmental variables may play a role as triggers for the development of allergies in later life, even if genetics play a larger role. These results highlight the need for more studies to determine the processes behind both early-onset and late-onset allergies. In order to create effective treatment and preventive plans, it is essential to understand these processes. Early diagnosis and treatment of congenital allergies might alleviate symptoms, whereas the rapid identification and removal of environmental triggers for late-onset allergies could enhance patient outcomes. In conclusion, the research emphasises that allergies are a complex illness that may be impacted by both genetics and the environment. Better management and understanding of allergies throughout life phases requires a more sophisticated approach in healthcare and research.

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