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APPROACH TO TREATMENT OF ALLERGY BY CONSUMPTION OF QUAIL EGGS

BY J.C. TRUFFIER

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BY J.C. TRUFFIER (Marcel Zara Prize)

For about the last 10 years (1968) with the aid of the following dual circumstances, i.e. empirical observations of wild fowl breeders and therapeutic chance from the outset, we have succeeded in enabling persons with an allergy (children, in particular) to live in their environment without concern for this so-called environment, nor the multiplicity of hostile allergens, with no treatment other than a few courses of eating raw quail eggs, to be repeated upon request.

This investigation, in light of results obtained and confirmation of previous cases, is continuing with a certain extension. It involves probably long-term therapy with changes in background context and not treatment of acute episodes.

With the aid of clinical, laboratory and biochemistry data, we are attempting to understand the reason.

Starting hypothesis

In 1976, following the observation by a quail breeder (R. Cordonnier) who saw the gradual disappearance of existing asthma and constant dyspnoea in his spouse (allergy to: feathers, dust, dog dander) and then that of his employees.

This observation was confirmed by another breeder (R. Albert) who successfully experimented with this treatment on his own family and friends without concern over the extent nor quality nor duration of the disease (asthma). This idea came to us in 1968.

Indications

For ethical reasons, this investigation started with cases which were refractory to all long-term therapy (failure of specific or non specific desensitisation, mineral water therapy etc.), and sometimes steroid-dependent.

In 1969, the first case of pollinosis was treated, and then the investigation was extended to include rhinitis, spasmodic cough, allergic conjunctivitis, as well as certain skin diseases (prurigo, eczema, psoriasis), gastro-duodenal ulcer and lastly, to allergic disorders of the scalp and then alopecia (notion of egg-enriched shampoo).

Currently, not only are refractory and long-standing cases treated, but also asthma and other common allergies.

Since 1968, over 800 patients have been treated, about 60 of whom over the last 8 to 10 years.

Over 200 case reports have been compiled by allergologists, paediatricians or general practitioners unrelated to the investigation, most of the time with skin tests before and after treatment, sometimes on several occasions. Lastly, in light of hepatic tolerability, certain sequelae of hepatitis have been treated successfully, a few cases of so-called allergic migraine, and lastly, some conditions of malnutrition.

Dosage, method of ingestion, material used

We prescribe on average 6 quail eggs per day in a single dose, during 9 days - with discontinuation for 9 days – followed by resumption for 9 days and sometimes a 6 day consolidation course of therapy, again after discontinuation for 9 days (5 quail eggs = 1 hen's egg by weight).

But for some disorders (asthma in particular), in light of the intensity of reactions during a course of therapy, we take a more cautious approach to the first course of therapy (4 eggs during 3 days – 5 eggs the next 3 days, and then 6 eggs the last 3 days).

The eggs are ingested raw, in the morning, fasting. They can be beaten with addition of salt and pepper and milk, and flavoured with whatever flavouring. But, alcohol is prohibited as well as heating (a cold lunch after consumption).

After many trials in the same breed, we set our sights on the B. Minna strain (Tublerie breed by Rochefort created in 1963).

This strain is the result of a cross-breed with Japanese quail (Coturnix, Coturnix Japonica) and wild quail (Coturnix, Coturnix, Coturnix) for the purpose of improving vitality of quail for target practice,

The egg from this strain is characterised in particular by its high albumin content.

Summary of clinical findings

1. Rebound phenomenon

During the course of therapy, between day 3 and day 6 (in over 80% of cases), an exacerbation of baseline signs is observed, i.e. sometimes development of eczema or prurigo in an asthmatic patient, an acute episode of asthma in a patient with rhinitis, etc., and then, in spite of continuation of therapy, the very gradual diminution of clinical signs is observed, but after a certain period of latency (15 to 45 days).

This improvement can range up to complete disappearance of the so-called signs, for a variable length of time – 5 to 6 months on average – and up to 6 years in some cases in our own investigation.

Progressive recurrence of the clinical signs leads to a new course of therapy which has the same effect in over 90% of cases.

But there is no preventive effect; pollinosis has to be treated starting with the occurrence of the first clinical signs and not before, an allergic episode has to be treated at the end of an acute episode, multiple allergies with pollen symptoms require another course of therapy with the start of the pollen season.

2. In spite of the disappearance of symptoms, the patient is never permanently cured, and, even after 8 years of a clinically asymptomatic course, can relapse. Another course of therapy makes these disorders disappear.

3. Courses of therapy have a variable result over time; the same quantity of eggs consumed by a given patient can lead to major improvement for periods of 4 months to 4 years. But generally, courses of treatment are increasingly spaced out over time.

4. Dosages are low: about 110 to 150 eggs at the start followed by 60 eggs per course of therapy (yearly, twice yearly) for a cost price of 50 to 70 francs at the start and 25 francs subsequently

5. Positive skin tests never disappear, even after 10 years' follow-up. They often seem to be exacerbated after the first courses of therapy, and diminish slightly afterward. Another course seems to again produce a positive response.

6. In terms of laboratory data, in our investigation we noted the following:

- a change in eosinophil count, which is sometimes appreciable, often with an increase at the start and then subsequently a normalised count;

- a major change in overall IgE. In 90% of cases (first study on 45 cases analysed before and after a baseline course of therapy), this change was observed both in one direction (60% decrease) as well as in the other (30% increase) but sometimes with a coefficient of 10 and slightly more than one month (Laboratoires Levy, Fournier, Serea). However, it would appear that a sudden rise in IgE is observed during the course of therapy (.e. after about one month) followed by an appreciable decrease starting with months 2 or 3. But this remains to be confirmed.

Unfortunately it was not possible to assay specific IgE due to technical reasons.

A first study conducted with IgA seemed to show an appreciable increase at the same time.

7. This therapy appears incompatible with specific desensitisation (different mode of action?). It is even advisable not to undertake it after its too-recent discontinuation.

In our opinion, it should be administered before, for the following reasons: simplicity of prescription, low cost, little constraints, possible prescription in young children without a prior assessment by an allergologist, and results in patients with multiple allergies with a single treatment.

8. We needed to have many cases over many years to understand, in the end, the problem which appears essential and which justifies certain previous cases of failure: avoidance of the allergen responsible for clinical symptoms during the course of therapy allows the subsequent persistence of symptoms induced by this single allergen in a patient with multiple allergies in case of subsequent contact with it. The former disappear with a new course of therapy, but only after re-introduction (re-challenge) with the so-called allergen. Example:

Ge...Va... 5 years of age:

- Chronic rhinitis, cough, repeated bronchitis, asthma.
- Positive skin test: house dust, feathers, dog dander, rabbit dander.
- Setting: feather pillows, a pet rabbit, dog.

After initial therapy, disappearance of all symptoms except for asthma attacks in the presence of feathers.

Yet, during this course of therapy, feathers were avoided (the only avoidance acceptable to the family) based on advice of the allergologist.

Another course of therapy, and re-challenge with the pillow led to total disappearance of symptoms (one-year follow-up).

This enables us to understand some cases of failure with "pollinosis" Treatment initiated started during the Plane tree pollen period produced symptom relief up to the grass pollen period and so forth with the need for repeat courses of therapy or abandonment due to failure.

On the contrary, in the same patient, treatment undertaken with the start of the grass pollen season produced a good result.

Similarly, some patients can present with symptoms when they leave their usual environment (vacation).

9. Ten years of investigation led us little by little to beware of certain risks of therapy even though this investigation started only because of the desire to "first, do no harm", as known by the public.

A. Notion of egg related "shock"

Has not been observed to date, after over 5,000 courses of therapy, i.e. over 300,000 cases of consumption of eggs. In addition, it was observed that persons allergic to hen's egg are not allergic to quail eggs (USSR). But this risk should always be kept in mind.

We systematically performed an egg test which also can be hazardous.

Lately, we have replaced it by the basophil degranulation test, developed by Dr. Benveniste, here too, systematically. A quail egg antigen is going to be developed very soon.

B. Notion of third day

To be treated as a normal episode (steroids if necessary) but in particular warn the patient of this. In principle, it involves an induced episode. Up until now, a few problems have occurred without harmful consequences, here too, in over 5,000 courses of therapy.

C. Pollution, egg transmitted diseases

It is necessary to use a breed under strict health control. No overly long storage (about 10 days in the lower part of the refrigerator). Only one case of salmonellosis was reported whose origin could not be demonstrated.

Some cases of minor intolerance (nausea, gastralgia) have been perhaps erroneously attributed to the method of ingestion.

Cases of febrile reaction, pronounced fatigue, have been reported, and also a few cases of skin rash, copious expectoration or migraine. Here too, these reactions perhaps have been erroneously included under the heading reactions.

Clinical results

It is very difficult to give an overall numerical assessment in such an investigation:

- improvement with increasing number of cases;
- a treatment initially reserved for failures with previous conventional therapy;
- identical dosage in adults and children, for practical reasons;
- investigation conducted with total empirical method, in the absence of any reference dosage, etc.

In particular, in asthma (about 65% of cases), chronic infection, the dominant influence of psychological factors, certain hormone dependence are so many causes of failure or partial results.

Sometimes dissociation of factors is observed in asthma. For example, episodes with dominant psychological, infectious or hormonal factors persist, even though the allergic component seems to have disappeared.

Currently, we believe that we have obtained 80% good results in children (or even 90% in children 2 and a half to 5 years of age), 50% or more depending on the disorder in adults, but we prefer certain isolated and evaluable statistics.

- 45 patients tested in 1970 by a university department of allergology. In 1977, about 60% of good results.
- 18 patients, all children. (Rochefort Hospital department, Dr. Hermouet): 17 actual good results. One partial result: eczema which relapsed after 6 months of disappearance and did not improve with a new course of therapy.
- Dr. Dejussieu, general practitioner, Rochefort. 25 cases of different types of allergy in adults and children, only one clear failure but the allergic origin of asthma was never demonstrated (adult).

Furthermore, some specific cases deserve our attention:

- asthma with continuous dyspnoea disappeared after 20 years of duration (10 years follow-up);
- CSA, disappearance after 30 and 40 years existence;
- CSP, positive results after 20 years and even 45 years of existence;
- prurigo, diffuse systemic lichen planus: disappearance after 13 years' existence;
- allergy to gold salts: disappearance within three weeks (little follow-up);
- total scalp exposing alopecia: hair re-growth two months after start of therapy and after three years of conventional treatment (university report).

Foreign references

Alas, although they are very rare, they seem to confirm our findings while evidencing certain previous reports.

- The therapeutic action of quail eggs has been known empirically in China, Indochina, Reunion Island, etc.
- Certain aphrodisiac properties have been attributed to this egg (A film by Antonioni called "The Red Desert", 1964, Brazil and in some regions of France). Moreover, this effect has been found clinically and in animals.
- But countries of Eastern Europe, in particular Russia and Poland, have studied this egg more precisely, in terms of therapeutic and biochemical properties. We do not know the current progress of their research; let us mention the rare documents which we have received.

"...It does not appear that large differences were observed between quail eggs and hen's eggs except 30% more egg yellow in the former and at equal weight (5 quail eggs = 1 hen egg). 5 times more phosphorous, 7.5 times more iron, 6 times more vitamin B1 and 15 times more vitamin B2 have been observed. Communications on the beneficial effect of quail eggs in the treatment of asthma, hypertonia (arterial hypertension?), ulcer disease, as well as other disorders exist..." (Gaievol, director of the Institute for study and research of the poultry industry in the USSR), 1968.

"...Perhaps there is a rare component in quail eggs which facilitates recovery and convalescence. It should not be overlooked that this may involve auto-suggestion and many long detailed and well-controlled studies are necessary before we can conclude on this aspect..." (Iglin, 1968).

"...But even the Egyptians from the time of the ancient Pharaohs have attributed special properties to quail meat...? (Marsh, A.F., 1967).

"...A. Jastrzebiec, in the poultry genetics laboratory directed by Prof. B. Domanska, mothers of children with allergic asthma as well as other diseases come to visits with such a prescription.

Laboratories of major cosmetic firms in Japan and other countries are seeking to discover the influence that the white of these eggs and embryos may have on human skin.

It is difficult to enumerate the real or assumed qualities attributed to quail eggs..." (Article reprinted from a Polish daily.)

"...In Poland, many mothers who have allergic children raise quails at home to obtain fresh eggs. We regularly provide eggs to patients who suffer from asthma, albuminuria and liver disorders and we observe that they eat hen's eggs with no problem. In our area in Biclany, the hospital purchases quail eggs for children who attend kindergarten. After my trip to the Crimea, I know that quail eggs and quails are used in centres of prevention, sanatoriums and in hospitals in the Soviet Union...". "Quail eggs can be eaten by persons who are allergic to hen's eggs. Such allergy can exist in children who from birth have eaten only quail eggs..." (Przepiorki (quail) B. Domanska, 1973).

Up to 5 eggs a day can be used, jointly with usual medicinal products if the body tolerates them; if not, asthma attacks may be worsened.

In the region of Sotchi, 3 breeds, each numbering 100,000 quails, are used solely for hospitals. Up to 250 eggs per course of treatment are used. Asthma and diabetes are treated successfully, but it appears that researchers have not found a large difference between quail eggs and hen's eggs.

The late Professor Obtulowicz, from the "Klinica Chorob Alergicznych ● Akhdema Medyczna ● Krakow, Poland" recommended quail eggs to treat asthma caused by allergy in children...(Letter received directly from Poland), 1975.

Biochemistry

Started in 1974 by Dr. Lucotte, geneticist, specialising in quails (former quail department of the CNRS)*, consultant to the enzymology laboratory of the CNRS (Gif-sur-Yvette, France).

From the start (starch gel electrophoresisl) the existence of two additional proteins was observed in the egg white, compared to similar species studied: grey and red partridge, Virginia white fish, California white fish, pheasant and hens.

The following were conducted:

- A study of protein in egg white and enzymatic activities (1975).
- Protease inhibiting activity of egg white with isolation of ovomucoid (1976).
- Conalbumin from egg whites and antibacterial properties.
- Study of catalase activity in egg white (1976).
- Study of the protein transporter of riboflavin.

Ovalbumin.

Ovomacroglobulin. Lysozyme (1976).

- Lastly, a study of proteins in egg yellow (1977).

These different studies among other things made it possible to obtain anti-quail sera and will make it possible to conduct immunoelectrophoresis before, during and after treatment (ongoing project).

But, starting in 1969, Feeney et al. (University of California), the only laboratory in the world specialising in the study of avian ovomucoids, compared the affinity of different inhibitors with human trypsin.

The majority of ovomucoids analysed have little or no affinity for human trypsin (hen, pheasant, turkey, duck, penguin, casowary, emen, ostrich, rhea bird, tinamou), with the exception of the Japanese quail which for 2 µg, inhibitor/1 µg trypsin reached a level of 76% inhibition, with those of Kunitz being 95% and Tinabeen also 95%.

The authors comment that it is necessary to take into account molecular weight in estimating affinity; in this regard the MW of quail is much lower (28,000) than other conventionally used inhibitors, to establish that ovomucoid in this species is an excellent inhibitor of human trypsin.

Furthermore, they demonstrated that ovoinhibitor may also be a protease inhibitor (1971).

In 1952, they had demonstrated the antibacterial activity of conalbumin in egg white (protection of the embryo).

Animal studies

Empirically, it seems to confirm the clinical cases (disappearance of eczema and of alopecia at the same time in dogs).

A study was conducted in 1969, unknown to us, without taking into account the fact that an antihistamine effect on one hand had never been observed and that the rabbit is an exclusive herbivorous species on the other hand.

Here are the results:

- In isolated organs (rat and guinea pig ileum): no protection against histamine.
- On blood pressure and respiration in the rabbit subjected to the effects of histamine: no action.
- On the LD 50 of histamine in mice: no protection.
- In animals (rat, mouse, rabbit, guinea pig) treated preventively during several days: results on hypotension and histamine-related bronchospasm were variable.

Currently, the following project is ongoing:

I) Effect on production of specific IgE and sensitisation of basophils and mast cells.

II) Effect on basophil degranulation, mast cell degranulation.

III) Distal effect.

Mode of action

Bleuminck and Young (1971) demonstrated that ovomucoids isolated from hen's eggs has an atopic allergen activity as well as trypsin inhibitory activity. They differentiated these two activities and attributed ovomucoid as being responsible for egg allergy.

Ovomucoid from quail egg has three very interesting characteristics:

1) Low molecular weight (28,000).
2) Heat-resistant (first observations made with cooked egg).
3) Human trypsin inhibitory activity.

Umgard and Dangaard (1955) in addition demonstrated that release of histamine from the isolated lung in the guinea pig during anaphylaxis was lower in the presence of a protease inhibitor such as trypsin inhibitor extracted from soybean.

Therefore, this protease inhibitory action, in particular human trypsin inhibitory action, cannot be neglected.

But the following findings:

- Absence of any antihistamine effect.
- Possibility for the body to develop new allergies and for recurrence of older allergies after a more or less length of time.
- The fact of having some types of asthma disappear, awakened by beta-blockers and during beta blocker therapy.
- Incompatibility with desensitisation which theoretically would establish an IgG barrier between antigen and IgE.
- The need for presence of the allergen (and in principle the specific IgE) so that a result is obtained, leads us to consider for this egg the role of a blocking antigen or inhibiting pre-existing antibodies bound to the mast cell, preventing degranulation; moreover, perhaps after a first degranulation (third day effect) by tachyphylaxis?

This role may be played either by ovomucoid alone or by other substances in the egg (antigen mosaic) that it may "transport".

Whatever the cause, we believe that the method of action lies at the very heart of the problem, that is, at the level of the antigen-antibody-mast cell.

From a much simpler standpoint, everything occurs as if the allergic subject had a deficiency of product X.

*French National Research Study Centre

This deficiency may be partially or even totally compensated by one or more courses of egg therapy; it tends to recur little by little but we can re-compensate it as necessary.

Conclusion

This investigation, the result of chance and of empirical observation, performed with our own personal methods, with no special knowledge in immuno-allergology, indeed contains gaps, but does have a clear clinical reality: many allergic subjects no longer suffer from their disorder following ingestion of raw quail eggs.

But although it is possible to control some long-standing cases refractory to currently used long-term therapies, in our opinion it appears more logical once its safety has been completely demonstrated, and after serious animal studies to plan prevention – cure (that is, treatment starting with the occurrence of the first symptoms of the allergic disease, which is a life-long disease – which produces much better results).

Non avoidance of the allergen during treatment appears to be an essential condition for clinical success.

Biology and biochemistry are not incompatible with the effects observed (existence of protease inhibitors with human anti-trypsin activity).

The mode of action remains to be elucidated but appears to lie on the level of the antigen-antibody and mast cell reaction.

We only wish to open up an avenue of research in the long-term treatment of allergic disease, perhaps by a change in allergic context.

Perhaps one day, some of our hopes will be confirmed or refuted in the treatment of so-called autoimmune diseases.

Perhaps one day, by elucidating its mode of action, we will understand the mechanism of allergic disease...

This study is dedicated to all those who trusted us or aided us in our difficult times.

In particular, Dr. Cotoni, hospital paediatrician at La Rochelle, who was present from the start of the project.

We wish to thank in particular Professor Clause Polonovski for his trust as soon as he learned of the topic, for his moral support and his advice.

It is also dedicated to a young patient, Martine Remaud, who since has died in a traffic accident.