

# Palindromic rheumatism: Effect of dietary manipulation

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**Key words:** Palindromic rheumatism, diet, food.

## ABSTRACT Objective

*Evaluation of the contribution of dietary components in triggering the attacks of palindromic rheumatism (PR), and the effect of dietary manipulation on the frequency and severity of PR attacks.*

## Methods

*Sixteen patients (10 males, 6 females) were diagnosed as having PR during 1994-8 in one center. Their mean age was  $45 \pm 6$ , duration of symptoms prior to diagnosis was  $4 \pm 1.4$  years, and frequency of PR attacks were  $3.1 \pm 1.8$ /month. All patients were instructed to make a list of the food that was consumed daily and to specify the dates of PR episodes. Data were evaluated after a period of 2-4 months in each patient.*

## Results

*In 5 patients (31%) there was an association between episodes of PR and certain foods that were consumed within 36 hours prior to PR episodes. These were fish (2 patients), eggs, canned vegetables and processed cheese (each in one case). Elimination of the relevant food from each patient's diet resulted in complete cessation of the PR attacks in two of the cases, while the other three had milder, infrequent attacks. Four patients were rechallenged with the offending food. In all cases it resulted in recurrence of the PR attacks. No association between PR episodes and prior consumption of certain foods could be documented in the other 11 patients.*

## Conclusion

*In some PR patients ingestion of certain foods, specific for each case, can trigger the typical attack. It is suggested that this association should be looked for in any PR patient, as elimination of the offending food from the diet may help in preventing the PR attacks.*

## Introduction

Palindromic rheumatism (PR), is characterized by recurring afebrile episodes of acute arthritis and peri-arthritis in one or several joints, lasting from a few hours to one week, leaving no residual damage (1). The etiology of PR is obscure. It has been debated whether PR is part of the spectrum of rheumatoid arthritis (RA), representing an early stage in the evolution of RA, as many cases of PR

eventually develop RA (1-3). Another etiology, namely "allergic rheumatism" was suggested by Hench and Rosenberg in their initial description of the syndrome (1). However, they could not prove such an allergic origin in their cases.

Following a clinical observation of a patient who experienced a complete remission of his PR attacks while on a low-calorie formula preparation, it was hypothesized that antigens in food may be the triggering factors of PR attacks. Thus, a prospective study was initiated to evaluate the possible relationship between food and PR episodes.

## Patients and methods

During a period of 55 months, 16 patients were diagnosed as having PR according to the diagnostic criteria of Mahonen *et al.* (4). These criteria include: recurrent attacks of sudden-onset mono- or polyarthritis or of para-articular soft tissue inflammation lasting from a few hours up to one week, verification of at least one attack by a physician, subsequent attacks at least in three different joints, and exclusion of other forms of arthritides.

All patients were instructed to make a daily list of the food that was consumed, and to specify the time and date of the PR attacks, their duration (in hours) and their severity (using a 1-5 scale). Data were evaluated for each patient after a period of 7-14 weeks. In each case the food that was reported to be consumed during the 48 hours prior to each attack of PR was marked. A search was then made to find which of these food products were consumed prior to at least 80% of the PR episodes in each patient. These food products were marked as possibly associated with the PR attacks. Another search was then made, to exclude food products that were consumed repeatedly during the attack-free intervals. Patients were then treated and followed for a period of 12 - 42 months.

To evaluate the specificity of the food diary data, a control group of 7 patients with familial Mediterranean fever (FMF), another "periodic disease", was included. These patients were also instructed to make a daily list of the food that was consumed, and to specify the

**Table I.** Effect of dietary manipulation on 5 patients with palindromic rheumatism.

Age, gender	47, M	45, F	48, M	42, F	44, M
Trigger	Fish	Processed cheese	Canned vegetables	Whole egg	Canned fish
Food-attack interval	12 - 18 hrs	18 - 36 hrs	12 - 24 hrs	18 - 24 hrs	18 - 36 hrs
Attack severity*, frequency	2.7 ± 0.8 3/month	3.4 ± 0.9 3/month	3.8 ± 0.8 2/month	4.5 ± 0.5 2/month	3.8 ± 0.8 1.5/month
Attack frequency after elimination	0	0.1/month	0.2/month	0.3/month	0
Rechallenge	yes	yes	no	yes	yes
Recurrence with rechallenge	yes	yes		yes	yes

\*Severity of attacks was self-recorded by the patients, using a scale of 1-5.

time of the FMF attacks. Their food diary data were evaluated as described for the PR patients.

### Results

There were 10 men and 6 women, their mean age was  $45 \pm 6$ . The mean duration of PR symptoms prior to diagnosis was  $4 \pm 1.4$  years. The frequency of PR attacks was  $3.1 \pm 1.8$  per month, and the mean duration of each attack was  $30 \pm 16$  hours. An elevated sedimentation rate (ESR) or C-reactive protein (CRP) during an attack was documented in 4/15 patients (27%). Two patients (12%) had a positive rheumatoid factor (RF). Patients had neither symptoms of FMF nor a family history of this disease. None of the patients had a history of allergic diseases, gastrointestinal diseases, elevated IgE levels or IgA deficiency. None of the patients had a family history of RA. All patients had normal levels of uric acid. The joint areas most commonly involved were the metacarpo-phalangeal and proximal interphalangeal, each in 12 patients, followed by the wrists in 10 patients and the knees in 8. The mean number of joint areas involved in each patient was  $3.5 \pm 1$ .

In 5 patients (31%), an association was found between PR episodes and consumption of certain foods within 36 hours prior to the attack (table 1). These were fish, canned fish (tuna and sardines), canned vegetables (corn and green peas), eggs, and processed (yellow) cheese, each in one patient. Altogether, these 5 patients had 27 episodes of PR during the observation period. The offending food, specific for each patient, was consumed prior to an attack in 23 of these 27 episodes (85%). It was not consumed at any other time during this pe-

riod. There were no skin or respiratory allergic reactions during the PR attacks. ESR and CRP were elevated during the attacks in only one case. IgE levels and eosinophil counts were evaluated during some of the attacks and were within the normal range. No association was found between specific food products and FMF attacks in the control group.

Each of these five PR patients was instructed to eliminate the specific food from the diet. Patients were then followed for a mean of  $2.1 \pm 1.1$  years. During that period 2 of the 5 patients were completely free of PR episodes, while the other 3 had milder, infrequent attacks (Table I). Taken together, prior to the dietary manipulation these 5 patients had a mean of  $2.2 \pm 0.8$  attacks per month which decreased to  $0.1 \pm 0.1$ . The mean duration of the PR attacks decreased from  $31.2 \pm 6.6$  hours to  $5 \pm 6.5$  hours, and the mean self-reported severity score decreased from  $3.6 \pm 0.7$  to  $1 \pm 1.4$ .

Four of the patients agreed to have a rechallenge with the specific offending food: a whole boiled egg in one case,

yellow cheese in the second case, canned tuna fish in the third, and salmon and carp (on two different occasions) in the fourth patient. In all cases a typical PR attack was observed by the treating physician within 24 hours of ingestion. In the third patient it was associated with elevation of the ESR and CRP to 58 mm/h and 3.4 mg/dl, respectively (normal < 30, and < 1, respectively). The first patient was also rechallenged with separated egg-yolk and egg-white: the egg-white triggered a typical attack while ingestion of egg-yolk resulted in very mild wrist arthralgia that resolved within two hours. The second patient experienced PR attacks with 3 different brands of yellow cheese. There were no attacks following ingestion of white cheese or other dairy products. The third patient had no attacks following ingestion of non-canned fish, or canned food other than fish (such as corn, peas, mushrooms and olives). In addition to a mild PR attack following the ingestion of carp, the fourth patient had also a very mild attack following the eating of salmon, but the ingestion of canned tuna fish did not

**Table II.** Comparison between palindromic rheumatism patients with food-triggered attacks (FT) and non food-triggered attacks (non FT).

	FT (n = 5)	Non FT (n = 11)
Male: female ratio	3: 2	7: 4
Mean age at the start of symptoms	41 ± 2	41 ± 6
Mean frequency of attacks/month	2.2 ± 0.8	3.5 ± 2
Mean duration of attacks (hours)	31.2 ± 6.6	29.5 ± 13
Mean number of joint areas involved	3.6 ± 0.9	3.5 ± 1
Mean severity score of attacks (range 1-5)	3.6 ± 0.7	3.4 ± 0.5
Positive rheumatoid factor	0	2

have any effect.

No association between the consumption of certain foods and PR attacks could be documented in the other 11 patients. There were no significant differences between these two groups regarding the mean age, gender, duration of PR attacks, number of involved joints or severity of symptoms, although patients with PR that was not triggered by food tended to have more frequent attacks (Table II). Two patients had a positive RF. Both developed RA, while another patient developed seronegative RA. In the other 8 patients PR attacks decreased in severity and frequency when treated daily with colchicine or hydroxychloroquine.

### Discussion

PR appears to be a heterogeneous entity, encompassing some other rheumatologic conditions such as RA during the early stages of their evolution. Several sets of diagnostic criteria for PR have been suggested (3-6). The patients in this study were included based on the criteria of Hannonen *et al.* (4). However, in retrospect all 16 patients met also the diagnostic criteria set forth by Guerne and Weisman (3), Williams *et al.* (5), and Gonzalez-Lopez *et al.* (6), which include in addition the absence of subcutaneous nodules, normal joint radiographs without calcification of cartilage or bone erosions, more than 5 attacks in 2 years, and a normal serum uric acid level.

It is difficult to prove a possible association between the reaction to food antigens and chronic arthritides such as RA. It is somewhat easier to evaluate such a relationship in conditions such as PR, where the attacks are short-lived and separated by symptom-free intervals. In this study the search for an offending food in each case was based on reviewing the patient's food diary for products that were consumed repetitively prior to PR attacks. The next step involved observation of the response to elimination of these specific food products from the patient's diet, and in addition performing rechallenges both with the foods that were suspected of triggering the PR attacks and with related food products. Placebo-controlled double-blinded evaluations would have increased the validity of these observations; however, these

were not feasible in this experimental design.

This study suggests that in a small group of PR patients certain food products may trigger attacks. Although these evaluations were not blinded, the response to the elimination of specific foods from the diet, combined with positive rechallenge tests in four of the cases and negative challenge tests to related food products, suggests that this association was real. The etiology of PR is unknown. In their original description of the syndrome, Hench and Rosenberg hypothesized that the symptoms may reflect an allergic reaction (1). Indeed, in 16 of their 34 patients food allergy was suspected as the cause of PR, but none were proven.

Later, there were several reported cases in which reactions to certain food products in relation to PR attacks were proven. In 1943, Vaughan described a 49-year-old man with PR in whom attacks were triggered by eating strawberries, with an incubation period of 12 hours to 3 days (7). There were no PR attacks while he abstained from eating strawberries during a follow-up period of one year.

Kaufman described a 44-year-old woman with attacks resembling PR in her left hip (8). After analyzing her food-symptom diary it was suspected that she was sensitive to eggs. While consuming an egg-free diet she had no attacks for 3 years, except for several occasions in which she accidentally or deliberately ate egg-containing foods. After 3 years she reported attacks which were unrelated to consumption of eggs. Another search for allergenic foods revealed that she was allergic to grapefruit, too. This food was also eliminated, resulting in cessation of the attacks.

Another case was thoroughly investigated by Epstein, himself being the patient (9). He noted that there were no major PR attacks when he avoided food containing sodium nitrate or peppermint. He performed numerous ingestion tests with nitrate-containing foods. Symptoms usually appeared within 16-30 hours after ingestion. He also performed a blinded study with capsules containing 5 mg sodium nitrate, 5 mg sodium nitrite or placebo. The sodium nitrate provoked moderately severe reactions, while so-

dium nitrite and placebo did not cause symptoms. In addition, PR attacks were also triggered by the ingestion of peppermint candy or 0.1ml of peppermint oil.

More recently, Panush described 3 patients with PR symptoms related to food: milk, shrimp and nitrate (10). They demonstrated subjective and objective PR symptoms while consuming the offending foods during double-masked food challenges. These patients were asymptomatic while on an elemental diet or not taking the offending food.

There is compelling evidence to suggest that in some patients rheumatic symptoms may be related to hypersensitivity to food products (11). Many patients with arthritis allege their symptoms to be food-related (10). However, in most cases this relationship has not been substantiated using methods such as the food-symptom diary, supervised food elimination, and rechallenge and blinded studies (9, 10).

Most of the studies on the effect of food on arthritis have involved patients with RA, while PR had not been thoroughly investigated in this regard. PR attacks may be triggered by certain food products in some cases. It is important to look for such a relationship using the methods described here or similar methods. Individualized dietary manipulation may prove beneficial for a subgroup of patients with PR.

### References

1. HENCH PS, ROSENBERG EF: Palindromic rheumatism: a "new" oft-occurring disease of joints (arthritis, peri-arthritis, para-arthritis) apparently producing no articular residues: Report of thirty-four cases (its relationship to "angioneuromal arthrosis", "allergic rheumatism" and rheumatoid arthritis). *Proc Mayo Clin* 1941; 16: 808-15.
2. SCHUMACHER HR: Palindromic onset of rheumatoid arthritis. Clinical, synovial fluid, and biopsy studies. *Arthritis Rheum* 1982; 25: 361-9.
3. GUERNE PA, WEISMAN MH: Palindromic rheumatism: part of or apart from the spectrum of rheumatoid arthritis. *Am J Med* 1992; 93: 451-60.
4. HANNONEN P, MOTTONEN T, OKA M: Palindromic rheumatism. A clinical survey of sixty patients. *Scand J Rheumatol* 1987; 16: 413-20.
5. WILLIAMS MH, SHELDON PJHS, TORRIGIANI G, EISEN V, MATTINGLY S: Palindromic rheumatism. Clinical and immunological studies.

- Ann Rheum Dis* 1971; 31: 375-9.
6. GONZALEZ-LOPEZ L, GAMEZ-NAVA JJ, JHANGRI GS, RAMOS-REMUS C, RUSSELL AS, SUAREZ-ALMAZOR ME: Prognostic factors for the development of rheumatoid arthritis and other connective tissue diseases in patients with palindromic rheumatism. *J Rheumatol* 1999; 26: 540-5.
  7. VAUGHAN WT: Palindromic rheumatism among allergic persons. *J Allergy* 1943; 14: 256-64.
  8. KAUFMAN W: Food-induced, allergic musculoskeletal syndromes. *Ann Allergy* 1953; 11: 179-84.
  9. EPSTEIN S: Hypersensitivity to sodium nitrate: a major causative factor in a case of palindromic rheumatism. *Ann Allergy* 1969; 27: 343-9.
  10. PANUSH RS: Food induced ("allergic") arthritis: Clinical and serologic studies. *J Rheumatol* 1990; 17: 291-4.
  11. PANUSH RS, STROUD RM, WEBSTER EM: Food-induced (allergic) arthritis. Inflammatory arthritis exacerbated by milk. *Arthritis Rheum* 1986; 29: 220-6.