C-Reactive Protein: An Indicator of Complications in Meningococcal Meningitis

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Summary

Twenty five culture positive patients with Meningococcal disease were selected out of a total of 221. C-Reactive proteins (C.R.P.) at the time of admission and during follow-up were done. This cheap and easy test was found to be a reliable predictor of complications occurring during the course of illness.

This test is of course of no help in predicting complications occurring in the initial phase of the illness like sensorineural deafness. The complications noted were hemiplegia, seizures, deafness, prolonged coma, tinnitus, facial palsy and defective vision.

Introduction

C-Reactive protein (C.R.P.) is a normal constituent of the plasma and is produced by the hepatocytes. It reacts with the capsular 'C' polysaccharide of pneumococcus behavinhg like a primitive antibody. It is a

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non-specific indicator of a number of inflammatory or destructive processes. It rises in bacterial but not in serous inflammation. It is a good diagnostic and prognostic tool for the clinician dealing with patients suffering from meningitis[1]. The significance of serum C.R.P., as an indicator of complications in adult suffering from Meningococcal meningitis, has been assessed here.

Patients and Methods

Twenty five patients admitted to the Medical 'A' Unit of Govt: Lady Reading Hospital, Postgraduate Medical Institute, Peshawar, from 15th March,1988 to 3Oth April,1988, were studied. These 25 cases were diagnosed clinically as Meningococcal disease and later proved to be group 'A' Meningococci on culture. The C.R.P. levels were estimated semiquantitatively by slide agglutination method.

A blood sample for C.R.P. estimation was taken at the time of primary diagnosis alongwith the other required specimens.

C.R.P. titers were then estimated after three days of the initial test. After another three days the test was again repeated only in those cases where the C.R.P. levels remained elevated or did not fall or developed some complications.

Table-I shows the initial C.R.P, titers of the 25 Patients included in the study. Only one patient had a negative test, the rest of the patients showed a variety of titers ranging from 1/2 to 1/128.

Table-II shows the duration from the start of illness till arrival into the hospital in the 25 patients. One of the patient included in the study had received antibiotics pricr to admission in the hospital.

Discussion

Neurological complications are common in patients treated for bacterial meningitis. There are several methods which can predict the outcome of bacterial meningitis e.g. the type of skin lesions caused by meningococcal disease[2]. Serum C-Reactive protein (C.R.P.) is a test easily performed in a quantitative and semi- quantitative manner. It helps in differentiating bacterial from viral meningitis, being abnormally raised in the former. Its value

TABLE - I
INITIAL CRP TITERS AGAINST THE NUMBER OF PATIENTS

Initial CRP Value	Nos. of Patients	%
1/2	3	(12)
1/4	5	(20)
1/16	4	(16)
1/32	4	(16)
1/64	5	(20)
1/128	3	(12)
Negative	1	(4)
Total	25	100

TABLE - II
TIME TAKEN BY THE PATIENT TO GET ADMITTED AFTER THE INITIAL SYMPTOMS

Days of admission after appearance of 1st symptoms	No. of cases C.R.P. test performed	%
Same day	6	(24)
1 day	6	(24)
2 day	7	(28)
3-4 days	2	(8)
5 days and above	4	(16)
Total	25	100

increases irrespective of the duration of illness, age, causative bacterium, cell count, erythrocyte sedimentation rate and the grade of fever. On the contrary it is extremely unusual for the C.R.P. value to be raised in viral meningitis.

Very high initial levels may herald neurological sequelae[3]. If the course of the disease is uncomplicated, C.R.P. level falls to normal levels. If it persists to rise, it is a predictor of sequelae like subdural effusion or in accompanying otitis media[1]. Our study also shows that high initial C.R.P. levels,as well as rising titers, predict, complications significantly. Early complications like sensorineural deafness is unlikely to be detected[4]. Though this test is not a substitute to lumbar puncture, it can be of diagnostic and prognostic significance in case lumbar puncture fails[5]. It is worth mentioning that some workers have not found this test very useful in prediction of sequelae in bacterial meningitis[6]. Since the test is cheap and easy to carry out, it should be used as an adjunct to other investigations in meningococcal disease.

Results

Out of a total of 221 patients with Meningococcal disease, 25 culture positive group A patients were included in the study. Table-I shows the initial levels of C.R.P. in the 25 patients studied, Table-III shows the comparison of C.R.,P, levels amongst the patients with and without complications.

TABLE - III
COMPARISON OF THE C.R.P. TITERS OF PATIENTS WITH COMPLICATIONS OF MENINGITIS AND THOSE WITHOUT COMPLICATIONS

Initital C.R.P. Value	Patients with Complications Nos. %	Patients without Complications Nos. %
1/2	1 (25)	3 (75)
1/4	1 (17)	5 (83)
1/16	--	4 (100)
1/32	2 (50)	2 (50)
1/64	2 (40)	3 (60)
1/128	2 (67)	1 (33)
Total	8 (32)	18 (68)

Most of the patients without complications showed lower initial levels of C.R.P.,while the patients with complications revealed higher levels. According to Table-IV, three patients had very high initial levels. Out of which one had hemiplegia, the second had prolonged coma and the third had an uncomplicatcd recovery.

When the C.R.P, test was repeated after 3-days the patient with hemiplegia had a C.R.P. titer that remained elevated, whereas it increased in six cases, Five patients amongst these developed complications.In one patients with coma, the second C.R.P. titer was lower than the first and the patient started recovering.

With the third C.R.P. titer all cases showed a decrease except one who developed facial palsy and defective visual acuity.

TABLE - IV
A PROFILE OF C.R.P. TITERS OF THE 25 PATIENTS STUDIED AND THE COMPLICATIONS OCCURRING IN SOME

Case	Initial C.R.P. levels	Second levels	Third levels	Complications
1	1/32	1/16	-	-
2	1/4	1/16	-	Drowsy
3	1	-ve*	-	-
4	1/16	-ve*	-	-
5	1/128	1/128	1/64	Hemiplegia
6	1/4	1/16	-	-
7	1/16	1/32	-	-
8	1/64	1/32	-	Seizures
9	1/4	1/32	1/16	Deafness
10	1/64	1/128	-	-
11	1/16	1/32	-	-
12	1/128	1/32	-	Coma
13	1/4	1/16	-	-
14	1/32	1/64	1/128	Facial palsy with defective vision.
15	1/64	-ve*	-	-
16	1/16	1/64	-	-
17	1/64	1/128	-	-
18	1/128	-ve*	-	-
19	1/32	1/64	-	Tinnitus
20	1/32	1/128	-	-
21	1/4	1/2	-	-
22	1/64	1/128	-	Facial palsy
23	1/2	-ve*	-	-
24	1/2	-ve*	-	-
25	-ve*	1/2	-	-

* -ve abbreviates negative test

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