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Management of Suppurative Regional Lymphadenitis complicating BCG Vaccination in Newborns

GI AKENZUA* AND RM SYKES†

Summary

Akenzua GI and Sykes RM. Management of Suppurative Regional Lymphadenitis complicating BCG Vaccination in Newborns. *Nigerian Journal of Paediatrics* **1986; 13:65.** Twenty-two (1.9%) of 1,153 term infants given intradermal BCG in the first 7 days of life, between July 1983 and June 1984, at the University of Benin Teaching Hospital, developed suppurative regional lymphadenitis 1-5 months (mean, 2.6±1.2 months) after vaccination. Treatment with isoniazid 10mg/kg/day for 3-9 months (mean 5.2±1.7 months) resulted in complete resolution of adenitis in the 18 cases (82%) who were followed up. Ten (45%) of the nodes ruptured spontaneously and in one case, acid and alcohol fast bacilli were demonstrated microscopically. There was no significant difference between the infants with ruptured nodes and those with intact nodes except that the average size of the ruptured nodes was larger. It is concluded that suppurative regional lymphadenitis following BCG in newborns can be treated with a single antituberculosis drug; there is therefore, no need to expose such infants to the dangers associated with surgery.

Introduction

ALTHOUGH the role of BCG vaccination in the protection against tuberculosis is still a subject for debate, the procedure is widely accepted in tuberculosis control programmes. Thus, BCG is compulsory in 64 countries and recommended in 118 territories.[1] Earlier prospective controlled trials of mass BCG vaccination found protective effects ranging from 80%[2] to zero[3] effect. A recent large scale trial[4] from India reported poor results that prompted a review of existing policies, but two WHO study groups[5 6] felt that the Indian study should not be considered to mean that BCG is always ineffective. Since some necropsy studies have shown that BCG protects by limiting spread of infection and not by preventing its establishment,[7] BCG is of value in young infants, who are at risk of disseminated disease.

Indeed, there are many reports of BCG vaccination in newborns which suggest that it gives considerable protection against childhood tuber-

College of Medical Sciences, University of Benin, Benin City

Department of Child Health
*Associate Professor

Institute of Child Health
†Research Fellow I

Correspondence: Dr GI Akenzua

culosis.[8] However, the rare complications of BCG especially suppurative regional lymphadenitis also occur more often in young infants. A recent report[9] indicated an increased incidence of caseating regional lymphadenitis complicating BCG vaccination in newborns in a Hong Kong hospital; these infants were treated aggressively with a combination of surgery and chemotherapy.

The present paper describes our experience with the presentations of suppurative regional lymphadenitis following BCG vaccination in newborns and their successful non-surgical management at the University of Benin Teaching Hospital (UBTH).

Materials and Methods

The subjects were 22 infants who had BCG vaccination in the first week of life and later presented with enlarged fluctuant nodes in the axilla, supraclavicular region, or both, on the side of the vaccination. They were among 1,153 normal, term infants delivered in UBTH between 1st July 1983 and 30th June 1984 that were given 0.1 ml of a suspension of lyophilised BCG intradermally, in the left arm. (The BCG was obtained from Institute Merieux, Lyons, France and 0.1 ml of the reconstituted vaccine contained 0.01 mg, corresponding to 20,000-100,000 culturable particles). All the vaccinations were carried out by two public health nurses. The clinical details of the infants are contained in Tables I and II.

TABLE I

Data on 10 Infants with BCG-associated Suppurative Lymphadenitis in whom the Nodes ruptured spontaneously

Case No	*Sex*	*Birth weight (Kg)*	*Interval before onset (mon)*	*Site*	*Maximum diameter of node (mm)*	*Duration of therapy (mon)*	*Comments*	*Outcome*
1	M	2.9	3	Axilla	40	5	Ruptured after 4 weeks. No discharge. Culture negative.	Healed
2	M	3.7	1½	Axilla	28	9	Abscess; Discharge for 6 weeks after rupture; culture negative.	Healed with a scar
3	F	3.5	2½	SCF*	26	5	Ruptured after 3 weeks. Culture negative.	Healed
4	M	2.7	4	Axilla	30	7	Ruptured after 4 weeks. No discharge when last seen.	LF†
5	M	—	2½	Axilla	28	6	Ruptured after 6 weeks. Culture negative.	Healed
6	M	2.9	3	Axilla	40	4	Frank abscess. Ruptured after 3 weeks; Culture negative.	Healed with a scar
7	F	3.6	3	SCF	18	7	Ruptured after 4 weeks. Culture negative.	Healed
8	F	3.9	3½	Axilla + SCF	—	4	Supraclavicular node ruptured after 3 weeks; no discharge.	Healed
9	M	3.7	3	SCF	26	4	Spontaneous rupture after 3 weeks. Culture negative. AAFB present.	Healed with a scar
10	M	4.2	5	Axilla	30	5	Rupture after 8 weeks. Culture negative.	Healed

* SCF = Supraclavicular fossa. † LF = Lost to follow-up.

TABLE II

Data on 12 Infants with BCG-associated Suppurative Lymphadenitis in whom the Nodes were intact

Case No	*Sex*	*Birth weight (Kg)*	*Interval before onset (mon)*	*Site of Node*	*Maximum diameter of node (mm)*	*Duration of therapy (mon)*	*Comments*	*Outcome*
11	F	2.8	2	Axilla	20	7	Gland became progressively smaller.	Resolved
12	M	2.8	2	Axilla	16	6	,,	,,
13	M	—	1	Axilla	15	7	,,	,,
14	F	3.4	2	SCF*	17	3	,,	,,
15	M	2.7	3	Axilla	30	4	,,	,,
16	M	3.1	3	Axilla	20	1½	No change in gland when last seen.	LF†
17	F	3.2	1½	SCF	15	4	Gland became progressively smaller.	Resolved
18	M	3.1	5	Axilla	18	7	,,	,,
19	F	2.6	3	Axilla	12	3	,,	,,
20	F	3.5	3	Axilla	8	1	No change in gland when last seen.	LF
21	F	2.9	1½	Axilla	18	4	Gland no longer fluctuant when last seen.	LF
22	M	–	1	Axilla	16	3	Gland became progressively smaller.	Resolved

* SCF ≡ Supraclavicular fossa

\+ LF ≡ Lost to foillow up.

The infants were well and thriving when they presented with suppurating lymph nodes. Only one (Case No 6) had a low grade fever (Temp 37.8°C) associated with multiple abscesses on the scalp from which *Staph aureus* was cultured; this infant responded to treatment with cloxacillin.

Each subject received isoniazid 10mg/kg a day until the node was no longer palpable and sinuses when present, healed. Frank abscesses were not incised and nodes which were only fluctuant in some areas were not excised. No dressing was applied in any case of spontaneous rupture and, usually, only scanty seropurulent discharges were obtained from the nodes.

Results

The 22 infants with suppurative regional lymphadenitis constituted 1.9% of all term infants born in UBTH who had BCG vaccination in the first week of life during the year. The mean birth weight of the infants was 3.2 kg (SD 0.5) and they were vaccinated at a mean age of 4.3 days (SD 2.6). The average interval between vaccination and the softening of enlarged nodes was 2.6 months (range 1-5 months). No other complication of BCG vaccination was encountered during the period.

Twenty infants had solitary nodes: 14 in the axilla and 6 in the supraclavicular area. One had

multiple nodes in the axilla and another had two nodes, one in the axilla and the other in the supraclavicular fossa. Three of the infants had frank abscesses which were pointing to the skin and others had nodes with fluctuant areas. Radiographic examination of the chest was done in 10 infants but was reported normal in each case. The mean duration of treatment was 4.2 months (SD 2.9). In 10 patients, the softened nodes ruptured spontaneously but culture of the discharges failed to grow any organisms. Microscopy in one case (No 9) revealed acid and alcohol fast bacilli (AAFB). In nine of the 10 cases, healing occurred within two to three months while one was lost to follow-up. In 12 patients whose nodes did not rupture spontaneously, these nodes became progressively smaller (9 cases) until they completely disappeared after an average duration of treatment of 5.4 months (SD 1.3); three were lost to follow-up after 1-4 months of treatment. The data from infants whose nodes ruptured spontaneously are compared with those whose nodes did not rupture in Table III; the comparison shows that the two groups differed significantly only in the average size of the nodes ($p<0.001$).

TABLE III

Characteristics of Subjects with intact Nodes and those with spontaneously ruptured Nodes

Characteristics	*Nodes*		*t**	*p*
	Ruptured	*Intact*		
Mean birth weight (Kg)	(9) 3.5±0·5	(10) 3.0±1.0	1.389	> 0.1
Mean interval before presentation (months)	(10) 3.1±0.9	(10) 2.5±1.2	1.277	> 0.2
Mean maximum diameter of nodes (mm)	(9) 29.6±6.9	(12) 17.9±6.4	3.966	<0.001
Mean duration of treatment (months)	(10) 5.4±1.3	(12) 4.2±2.1	1.644	> 0.1

Numbers in parentheses represent no of subjects
*Student t test.

Discussion

The history of immunization against tuberculosis is a story of setbacks, controversies and surprises.[10] Ten Dam *et al*[8] reviewing some studies involving BCG vaccination in the first few days of life, concluded that the evidence, taken on face value, suggests that BCG in newborns confers considerable protection against tuberculosis in infants and young children. The vaccine is cheap, easy to administer, and if it is given in the first few days of life, it allows children to be protected at a time when epidemiological factors such as the prevalence of atypical mycobacterium infection is unlikely to affect response to vaccination. These advantages would be outweighed if complications of BCG in newborns were frequent or their management hazardous.

The clinical course of the patients in the present study suggests that suppurative lymphadenitis following BCG vaccination in newborns can be treated conservatively with one oral antituberculous agent. About 45% of the nodes may rupture spontaneously but they will heal on drug treatment without surgical drainage or dressing. Intact nodes need not be incised or excised.

Hence, there is no need to expose infants to the dangers of general anaesthesia.

The 1.9% incidence of suppurative lymphadenitis among these infants is slightly higher than 0.3% reported for vaccinations made into the arms with good techniques.[11] It may be that we used a relatively high dose of BCG for newborns. Some workers have suggested lower doses of BCG for newborns in order to reduce the incidence of suppurative lymphadenitis. We think that there is no compelling reason to reduce the dose of the vaccine since the incidence of this complication, which is easy to treat, is relatively low and, other more serious complications such as BCG osteomyelitis[12] are rare. Furthermore, such practices may account for some of the disparate results of BCG vaccinations in newborns. Other workers have suggested delaying BCG vaccination for several months after birth because of the relatively low immunologic response of newborns. However, a recent study has shown that the higher incidence of poor response to BCG vaccination in newborns may be due to some other perinatal factors.[13]

Our study does not explain why some newborns develop suppurative adenitis after BCG. It is of interest, however, that the likelihood of a softened node rupturing spontaneously does not depend on the birthweight, site of the node nor the duration of the interval between vaccination and the onset of suppurative lymphadenitis. Nevertheless, it is noteworthy that the average size of nodes which ruptured was significantly greater than that of those which remained intact.

The most important lesson from our experience is that suppurative nodes resolve promptly on treatment with isoniazid alone. There is therefore, no reason to increase the cost of BCG vaccination, nor expose young infants to the dangers of general anaesthesia by treating suppurative regional lymphadenitis following BCG vaccination, by surgery.

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