BCG ADENITIS: ACTION OR INACTION?Ashwin V. Apte¹, Shruti Sarkar², Dipankar Sarkar³**HOW TO CITE THIS ARTICLE:**

Ashwin V. Apte, Shruti Sarkar, Dipankar Sarkar. "BCG Adenitis: Action or Inaction?". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 13, March 31; Page: 3446-3454, DOI: 10.14260/jemds/2014/2304

ABSTRACT: BCG adenitis, the enlargement of regional lymph nodes after BCG vaccination is one of the common complications seen. BCG adenitis may present at varied time interval after the vaccine administration. Different medical and surgical treatment modalities have been reported for its management. We report our management experience of BCG adenitis seen over a period of 1 year.

KEYWORDS: BCG Adenitis, BCG vaccine, suppurative adenitis, non suppurative adenitis.

INTRODUCTION: BCG vaccine has been in use since 1921 and is regarded to be a safe vaccine. It is known to have a low incidence of serious adverse reactions.¹ BCG adenitis, i.e. the enlargement of regional lymph nodes after BCG vaccination is one of the common complications seen². After BCG vaccination, the bacilli multiply rapidly and reach the regional lymph nodes via the lymphatics. Following this, there is hematogenous spread of BCG to various organs and formation of very small foci. This constitutes the normal reaction to BCG vaccination. Therefore it is logical that some enlargement of lymph nodes may happen. When the lymph nodes are large enough to be easily palpable and cause concern it is termed as BCG adenitis. Various medical and surgical treatment modalities have been tried and reported for the management of BCG adenitis. We report our management experience in 10 patients with BCG adenitis seen over a period of 1 year.

METHODS: We describe a case series of 10 patients with BCG adenitis seen from January 2013 to December 2013. These patients were seen in Pediatric Surgery and Pediatric clinics. Patients were said to have BCG adenitis if there was easily palpable lymph node enlargement in a child recently given BCG vaccine in the absence of any other illness. Information recorded at the time of presentation included age, weight, age at BCG vaccination, first appearance of enlargement of lymph nodes and examination findings.

All the parents were explained the treatment plan, further course was documented and all were followed up across the study period of one year. Patients with non suppurative adenitis were followed up regularly and kept under observation, no treatment was given. All patients with suppurative adenitis were advised needle aspiration and patients were followed up regularly.

Parents were explained that if needle aspiration failed surgical excision of adenitis would be done. None of the patients were given anti-tubercular therapy. Findings on the last visit during the study period were recorded as the outcome. Adenitis was said to have resolved if the lymph nodes were less than 1cms in size. Lymph nodes were said to have regressed if the size had decreased but they were still more than 1 cm.

RESULTS: In this study period we saw 10 patients with BCG adenitis. All the details are given in the table. Of these 3 were females and 7 were males. Patients had received BCG vaccine at a mean of 5

ORIGINAL ARTICLE

days after birth (range 2 to 15 days after birth). Age of presentation ranged from 1.5 months to 10 months. All were feeding well, thriving and did not have any other illness. Six children had suppurative adenitis at the time of presentation, 1 of them (case 3) developed suppuration 9 months after the first presentation. Nonsuppurative adenitis was seen in 4 patients.

Maximum lymph node size seen was 4 cms by 3 cms. All except one had axillary lymph node enlargement. Case 4 had left supra clavicular lymph node enlargement.

Of all the 10 patients it was seen that the lymph node size resolved in 8 patients. Mean time for complete resolution was 5.5 months with a range of 3–14 months. In 2 patients the lymph node size regressed when last seen and they continue to be followed. Of the 4 patients with non suppurative adenitis lymph node enlargement resolved in 3 and in 1 the node regressed and the patient is still under follow up. Of the 6 patients with suppurative adenitis 5 resolved and 1 regressed. Needle aspiration was done in 3 patients, lymph node size resolved in 2 of these patients in 5.5 months mean time with a range of 4 -7 months. None of the patients required re aspiration.

Spontaneous rupture was seen in 3 patients. Following rupture wound healing occurred in 2-3 months without significant discharge. Minimal scar present in both the patients. All 3 patients who had spontaneous (case no 3, 4, 5) rupture had suppurative adenitis who did not undergo aspiration. In all of these cases spontaneous rupture occurred at home in between two planned visits.

None of the patients in the present series required surgical excision.

DISCUSSION: BCG related adverse events are relatively uncommon and it is generally considered to be a safe vaccine. Non suppurative BCG adenitis is one of the commonest minor adverse reactions to this vaccine.¹⁻³ This complication is known to be related to the type of vaccine, dose and route of administration.⁴⁻⁷ Host factors include the age at which it is given and the immunological status of the recipient. Normal newborns even those who are immunologically normal are known to have higher incidence of complications as compared to older infants and children. Serious adverse events following BCG vaccination are likely to indicate immunodeficiency states.⁸⁻¹¹

Incidence of mild complications is said to be less than 1 per 1000 vaccinations whereas serious events like disseminated disease is less than 1 per million vaccinations.¹²

Treatment options that have generally been taken in past for BCG adenitis include conservative follow up, anti-tubercular therapy, oral antibiotics mainly Erythromycin, needle aspiration, incision drainage and excision of lymphadenitis.¹³⁻¹⁵ There is enough evidence to say that oral antibiotics and anti-tubercular treatment is not required. There is limited literature to prove the superiority of any one of the remaining treatment modalities over the others.

In a group of 50 patients with suppurative BCG adenitis, Caglayan S et al reported that in 20 out 23 patients in whom aspiration was done, adenitis resolved completely. Out of 50 patients, 16 had spontaneous rupture and 10 patients required surgical excision. Of these 10 patients 3 were in the aspiration group and had not responded to aspiration alone.¹⁶

Banani et al in a randomized control trial reported the effect of needle aspiration in 77 patients with suppurative BCG adenitis in 1994. In 43 patients belonging to the study group the nodes had been aspirated and 58% and 95% of these regressed in 2 and 6 months- time after aspiration. Out of the 34 patients in the control group in whom aspiration was not done 9% and 65% regressed in 2 and 6 months- time. In this study 3 out of 43 patients belonging to the aspiration group

ORIGINAL ARTICLE

had subsequent spontaneous rupture 15 out of 34 patients in the control group had spontaneous rupture.¹⁷

Satyanarayan et al in 2002 reported treatment of 18 patients with suppurative lymphadenitis by weekly needle aspiration. 16 out of 18 resolved in a mean time of 8 weeks.¹⁸

Singla et al described conservative management done in 20 patients with non suppurative lymphadenitis in which 17 resolved in a mean time of 9.1 months. Out of 20 patients 3 patients progressed to suppuration but these too regressed spontaneously on conservative management.¹⁹

Nazir Z recorded treatment course of 60 children with BCG adenitis who were seen between 1988 and 1990. 52 had suppurative adenitis and were treated surgically.²⁰

Govindrajan KK from Malaysia described treatment of 6 patients with BCG adenitis. Out of these 3 had suppuration and after needle aspiration resolved in a maximum time of 6 months.²¹

Chan et al described their experience of management of 11 patients who were seen with suppurative lymphadenitis over a 5 year period. Out of 11 patients 6 were managed with needle aspiration, 5 of these resolved in 1 to 6 months- time. One patient developed spontaneous rupture a month after presentation but despite this the wound healed in 2 weeks- time and the adenitis resolved completely 4 months later.²²

Cochrane review in 2013 has identified only 1 study which is a randomized controlled trial comparing aspiration with no treatment. Review concluded that aspiration alone is a superior choice although the evidence is low quality.²³

In the present series we have described 10 patients with BCG adenitis and documented their further course. Out of the 10 patients 4 had non suppurative and 6 had suppurative adenitis. Of the 6 patients 3 were managed by needle aspiration alone. None of the patients required re aspiration. Time for complete resolution ranged from 5 months to 1 year. Remaining 3 patients developed spontaneous rupture, of which one happened 9 months after the first presentation. However, the wound healed in 2 weeks- time and the adenitis resolved completely 2 months later.

Average resolution time in the aspiration group was 2.5 months with a range of 2-3 months, whereas the average resolution time in the group where aspiration was not done was 1.75 months range of 1- 2 months. The patients who had planned aspiration done may have had less liquefaction and hence may have taken longer to resolve whereas those having significant liquefaction progressed to spontaneous rupture before aspiration could be done. Spontaneous rupture in these patients may have allowed more effective drainage and hence shorter time to complete resolution than in the aspiration group.

All the patients with spontaneous rupture had a resultant scar howsoever minimal whereas patients in the aspiration group had complete healing. Prolonged discharge which is common result of rupture however was not seen in our patients. Hence to avoid persistent discharge as well as scarring, aspiration of suppurative adenitis should be the preferred mode of treatment.

The findings of this case series suggest that suppurative BCG adenitis can be managed by needle aspiration alone and surgery may not be required. However close monitoring of all adenitis even without suppuration is warranted as fluctuation indicating suppuration may appear late in the course and may result in spontaneous rupture.

ORIGINAL ARTICLE

Surgery should be reserved for patients who fail to respond to needle aspiration. Surgical excision requires general anesthesia and if complete resolution is achieved by needle aspiration alone, some infants can be spared invasive surgery and anesthesia with their associated difficulties.

CONCLUSIONS: Non suppurative adenitis is a benign condition that mostly regresses spontaneously. Reassuring the child's parents and expectant but close follow up is the preferred line of "inaction". Suppurative adenitis responds well to needle aspiration, mostly single aspiration but sometimes aspiration may need to be repeated. Antibiotics or anti-tubercular drugs are not required. Incision and drainage should not be done as it results in poor wound healing. Surgical excision should be reserved only for those who do not respond to needle aspiration.

REFERENCES:

1. Milstein JB, Gibson JJ. Quality control of BCG vaccine by WHO: a review of factors that may influence vaccine effectiveness and safety. *Bull World Health Organ* 1990; 68:93-108.
2. Lotte A, Wasz-Hockert, Poisson N et al. Second IUATLD study on complications induced by intradermal BCG-vaccination. *Bull Int Union Tuberc and Lung Dis* 1988; 63:47-59.
3. Goraya JS, Viridi VS. Baccile Calmette-Guerin lymphadenitis. *Postgrad Med J*. 2002; 78 (920): 327-329.
4. Teo SS, Smeulders N, Shingadia DV. BCG vaccine-associated suppurative lymphadenitis. *Vaccine* 2005 Apr 8; 23(20):2676-9.
5. Alrabbiah AA, Alsubaie SS, Bukhari EL et al Outbreak of Bacille Calmette-Guérin-related lymphadenitis in Saudi children at a university hospital after a change in the strain of vaccine. *Ann Saudi Med*. 2012 Jan-Feb; 32(1):4-8.
6. Hooi LN, Athiyah SO. An outbreak of BCG related lymphadenitis in Malaysian infants. *Med J Malaysia* 1994 Dec; 49(4):327-35.
7. Hengster P, Schnapka J, Fille M, Menardi G. Occurrence of suppurative lymphadenitis after a change of BCG vaccine. *Arch Dis Child*. 1992 Jul; 67(7):952-5.
8. Hesselting AC, Marais BJ, Gie RP et al. The risk of disseminated Bacille Calmette-Guerin (BCG) disease in HIV-infected children. *Vaccine*. 2007 Jan 2; 25(1):14-8.
9. Aytekin C, Dogu F, Tuygun N et al. Bacille Calmette-Guérin lymphadenitis and recurrent oral candidiasis in an infant with a new mutation leading to interleukin-12 receptor beta-1 deficiency. *J Investig Allergol Clin Immunol*. 2011; 21(5):401-4.
10. Pedraza – Sanchez S, Herrera- Barrios MT, Aldana – Vergara R. Bacille Calmette-Guérin infection and disease with fatal outcome associated with a point mutation in the interleukin-12/interleukin-23 receptor beta-1 chain in two Mexican families. *Int J Infect Dis* 2010 Sep; 14 Suppl 3:e256-60.
11. Santos A, Dias A, Cordeiro A et al. Severe axillary lymphadenitis after BCG vaccination: alert for primary immunodeficiencies. *J Microbiol Immunol Infect*. 2010 Dec; 43(6):530-7.
12. Grange M. Complications of bacille Calmette-Guérin (BCG) vaccination and immunotherapy and their management. *Commun Dis Public Health*. 1998 Jun; 1(2):84-8.
13. Oguz F, Sidal M, Alper G, et al. Treatment of Bacillus Calmette-Guérin associated lymphadenitis. *Pediatr Infect Dis J* 1992; 10:887-8.

ORIGINAL ARTICLE

14. Kuyucu N, Kuyucu S, Ícal B, et al. Comparison of oral erythromycin, local administration of streptomycin and placebo therapy for non-suppurative Bacillus Calmette-Guérin lymphadenitis. *Pediatr Infect Dis J* 1998; 17: 524–5.
15. Victoria MS, Shah BR. Bacillus Calmette-Guerin lymphadenitis: a case report and review of the literature. *Pediatr Infect Dis J* 1985; 4:295–6.
16. Caglayan S, Arikan A, Yaprak I et al. Management of suppuration in regional lymph nodes secondary to BCG vaccination. *Acta Paediatr Jpn.* 1991 Dec; 33(6):699-702.
17. Banani SA, Alborzi A. Needle aspiration for suppurative post-BCG adenitis. *Arch Dis Child* 1994; 71: 446-447.
18. Satyanarayana S, Mathur AD, Verma Y et al. Needle aspiration as a diagnostic tool and therapeutic modality in suppurative lymphadenitis following Bacillus Calmette Guerin vaccination. *J Assoc Physicians India* 2002 Jun; 50:788-91.
19. Singla A, Singh S, Goraya JS et al. The natural course of non suppurative Calmette-Guérin bacillus lymphadenitis. *Pediatr Infect Dis J.* 2002 May; 21(5):446-8.
20. Nazir Z, Quazi SH. Bacillus Calmette-Guerin (BCG) lymphadenitis-changing trends and management. *J Ayub Med Coll Abbotabad* 2005 Oct-Dec; 17(4):16-8.
21. Govindarajan KK, Chai FY. BCG adenitis – Need for increased awareness. *Malaysian J Med Sci.* Apr-Jun 2011; 18(2): 66-69.
22. Chan WM, Kwan YW, Leung CW. Management of Bacillus Calmette-Guérin Lymphadenitis. *HK J Paediatr* 2011; 16:85-94.
23. Cuello-Garcia CA, Perez- Gaxiola G, Jimenez Gutierrez C. Treating BCG – induced disease in children. *Cochrane Database Syst Rev.* 2013 Jan 31; 1:CD008300.

ORIGINAL ARTICLE

SL. NO.	AGE AT BCG VACCINATION	AGE AT SYMPTOM APPEARANCE	AGE AT PRESENTATION	SEX	Other illness	EXAMINATION FINDINGS LOCATION, NUMBER AND SIZE	SUPPURATIVE/ NON SUPPURATIVE	ASPIRATION DONE/ NOT	FURTHER COURSE	FINDINGS WHEN LAST SEEN (RESOLVED < 1CM, REGRESSED – LESS BUT STILL >1 CM)
1.	day 2	2M	6 M	M	NIL	rt axillary, three in no, 4*3 cms composite mass	suppurative	Aspiration done	decreased in size	resolved at 9 mnths
2.	day 7	2 M	4 M	M	NIL	left axillary, single, 2*2cms	non suppurative	no	decreased in size	resolved at 6 mnth
3.	day 2	4 M	6 M	M	NIL	lt axillary nodes, 2 in no, 3*2 and 2*2 cms	suppurative	no	spontaneous rupture at 16 m	resolved, 18 mnth , minimal scar
4.	day 3	1.5 M	7 M	M	NIL	lf supra clavicular node, single, 1*1.5 cm	suppurative	no	spontaneous rupture at 8 mnths	resolved at 10 mnths, scar
5.	day 4	1 M	4 M	F	NIL	rt axillary node, single, 2*1.5cm	suppurative	no	spontaneous rupture at 5 mnths	resolved at 6 mnths, minimal scar
6.	day 3	1.5 M	4.5 M	M	NIL	lf axillary two nodes, 2.5*2cms	suppurative	aspiration done	decreased gradually	resolved at 7 mnths
7.	day 2	1 M	1.5 M	F	NIL	lf axilla, 3 nodes, 2.5*2.5, 2*2, 2*1.5cms,	non suppurative	no	decreased in size	regressed at 3 mnths
8.	day 15	1 M	2.5 M	F	NIL	lf axilla, single node, 2*2.5cms	suppurative	aspiration done	1.5*1.5cms at 5 mnths	regressed, 5mnths
9.	day 4	1.5 M	7 M	M	NIL	rt axilla , 3 in number, 2*2.5, 2*1.5, 1.5*1.5cms	non suppurative	no	decreased to <1 cms size in 3 m	resolved at 10 mnths
10.	5 days	3 M	4 M	M	NIL	solitary lf axillary, 2.5*2cms	non suppurative	no	resolved after 2 mnths	resolved at 6 mnths

ORIGINAL ARTICLE

CASE 1- RT AXILLARY L N MASS WITH SUPPURATION

CASE 2- LF AXILLARY L N FIRM MASS

CASE 3- LF AXILLARY L N MASS SUPPURATION, SCAR FORMATION

CASE 5- RT AXILLARY SUPPURATED L N WITH SCARRING

ORIGINAL ARTICLE

CASE 6- LF AXILLARY TWO NODES, ONE SUPPURATING

CASE 3- LT AXILLARY SOLITARY NODE, SUPPURATED AND LEFT A SCAR

CASE 4- LF SUPRECLAVICULAR L N

ORIGINAL ARTICLE

AUTHORS:

1. Ashwin V. Apte
2. Shruti Sarkar
3. Dipankar Sarkar

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Surgery, PCMS, Bhopal.
2. Professor, Department of Pediatrics, PCMS, Bhopal.
3. Professor, Department of Pediatrics, PCMS, Bhopal.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Ashwin V. Apte,
Lake City Hospital,
B - 27, Kasturba Nagar,
Near Chetak Bridge,
Bhopal – 462023.
E-mail: drashwinapte@gmail.com

Date of Submission: 21/02/2014.

Date of Peer Review: 22/02/2014.

Date of Acceptance: 01/03/2014.

Date of Publishing: 28/03/2014.