Cervical lymphadenopathy in children

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The management of cervical lymphadenopathy in children varies widely between clinicians. It is recognized that clinical management can be improved by standardizing the diagnostic and treatment methods. This article presents an algorithm based on the available evidence for the management of cervical lymphadenopathy in children.

Cervical lymphadenopathy can be broadly defined as swelling and morbid changes of the lymph nodes in the neck (Rosenfeld, 1996). This may occur secondary to either intrinsic stimulation by various antigens and lymphomata or extrinsic invasion by malignant and inflammatory cells (Zitelli, 1981).

The nature of enlarged neck nodes in a child can be a source of genuine anxiety for the parents. Clinicians perform a variety of investigations when a child presents with a mass in the neck, because differentiating chronic inflammatory lymph nodes from neoplastic and lymphomatous nodes can pose a significant challenge (Telander and Filston, 1992). A major dilemma is when to perform biopsy of the node and when to reassure the parents and simply observe. A Medline search, using the words cervical lymphadenopathy, cervical adenopathy and neck lump limited to children up to the age of 12 years, produced 241 citations on various aspects of cervical lymphadenopathy. However, no standard clinical approach has been recommended reflecting the variation in clinical practice.

DIFFERENTIAL DIAGNOSIS

The vast majority of neck masses in paediatric practice are cervical lymphadenopathy (Telander and Filston, 1992). Often they are normal and self-limiting (Brown and Azizkhan, 1998) but can persist for several months (Davenport, 1996). Up to 90% of children between the ages of 4 and 8 years may have palpable cervical nodes without any systemic or locoregional disease (Park, 1995). The differential diagnosis in the remaining cases falls in to three main categories:

1. Reactive
2. Tubercular (both mycobacterial and non-mycobacterial)
3. Lymphomatous.

The incidence of each category varies from 32–64%, 23–40% and 7–13% respectively (Torsiglieri et al, 1988; Connolly and MacKenzie, 1997; Smith et al, 2000).

History

The evaluation of cervical lymphadenopathy commences with the history, and a few important points are given in *Table 1*.

Clinical examination

Lymph nodes greater than 10 mm in diameter are considered abnormal except in the jugulodigastric region, one of the commonest groups involved, where normal nodes can be as large as 15 mm (Armstrong and Giglio, 1998). Although the size of the node has not been a widely used criterion in children, Knight and Reiner (1983) advocate using a ruler to measure the size of the nodes to minimize interobserver variation.

Ultrasonography is also found to be a useful tool in evaluating the size and shape of cervical nodes (Ying et al, 1999). Important clinical features of the nodal masses are summarized in *Table 2*.

TABLE 1.
Summary points from history

Time of onset, duration and progression
Preceding upper respiratory tract infections
Any lumps outside the head and neck region
Travel abroad or contact with tuberculosis
Contact with cats

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INVESTIGATIONS

Cervical lymphadenopathy is frequently investigated by a large number of diagnostic studies, often with normal results (Torsiglieri et al, 1988; Davenport, 1996). A summary of these investigations is given in *Table 3*.

Out of the investigations outlined in *Table 3*, fine needle aspiration cytology (FNAC) (Patt et al, 1993) and ultrasonography are considered to be the most informative (Smith et al, 2000).

The combined use of FNAC for acid-fast staining, and the Mantoux test is shown to increase the diagnostic accuracy to 90% in suspected mycobacterial nodes (Lau et al, 1991; Weiler et al, 2000).

Fine needle aspiration cytology

FNAC is a well-established investigation in adults with neck nodes and is gaining popularity in children (Ramadan et al, 1997). Gamba et al (1995) recommend the use of FNAC to screen superficial masses in children if serious pathology is suspected. Bodenstein and Altman (1994) maintain that FNAC is the single most informative study in diagnosing cervical lymphadenopathy. Any fluid obtained is sent for culture of aerobic, anaerobic, tuberculous, and fungal organisms, and staining for acid-fast bacilli. If no fluid is obtained the needle and syringe should be flushed with normal saline for culture (Bodenstein and Altman, 1994).

Connolly and MacKenzie (1997) advocate setting up a facility to perform FNAC under topical anaesthetic cream, although a short general anaesthetic may be required in some children as a day-case procedure. Armstrong and Giglio (1998), however, favour excisional biopsy if malignancy is suspected, as lymphoma is the commonest malignancy presenting as cervical lymphadenopathy in children. FNAC is not an ideal investigation in cases of lymphoma and therefore excision biopsy needs to be considered (Clary and Lusk, 1996).

TABLE 2.
Important clinical features of nodal masses

Site and size
Mobility and fixation
Consistency
Tenderness
Matting (coalescence of several nodes resulting in a larger mass)

TABLE 3.
Available investigations for neck masses

Full blood counts
Fine needle aspiration cytology
Culture and sensitivity of fine needle aspiration
Heterophile antibodies
Chest radiograph, if tuberculosis is suspected
Ultrasonography
Toxoplasmosis titres, if contact with cats
Serology for viral infections

Ultrasonography

Ultrasonography is a useful tool as a preliminary imaging investigation (Gianfelice et al, 1986). It can be used to guide FNAC, is repeatable and easily available to monitor the disease progress without any risk of irradiation. The diagnostic accuracy and sonographic criteria for the evaluation of cervical lymphadenopathy is well discussed in the literature (Gianfelice et al, 1986; Ying et al, 1998). Inflammatory and reactive lymph nodes appear as round to oval masses that are usually discrete but can occasionally become confluent. Sonography is adept in distinguishing simple adenopathy from suppuration or abscess formation. However, it has only a limited role in differentiating inflammatory from neoplastic adenopathy. In a small study Bain et al (2000) showed that ultrasound-guided cutting-needle biopsy is successful with greater diagnostic accuracy in paediatric neck masses.

Magnetic resonance imaging and computed tomography can offer useful preoperative information on the size, number, location, and composition of the nodes and of the neighbouring structures. However, the imaging features are not pathognomonic and can only be an adjunct to the clinical findings (Nadel et al, 1996). These investigations should therefore be based on clinical suspicion and need rather than empirically performed in all cases.

Worrying features

If an inflammatory mass of more than 3 cm persists for more than 6 weeks, despite appropriate antibiotics, biopsy should be done (Brown and Azizkhan, 1998). An excised node is sent for bacteriological studies, routine histology, staining for Geimsa, acid-fast bacilli, Warthin-Starry, periodic acid-Schiff and methanamine (Rosenfeld, 1996).

Any of the features summarized in *Table 4* should prompt an early biopsy (Knight and Reiner, 1983; Brown and Azizkhan, 1998).

CONCLUSION

An accurate clinical diagnosis may not be possible and is not mandatory for the management cervical lymphadenopathy. The flow chart in *Figure 1* attempts to simplify and standardize the approach to the management of cervical lymphadenopathy in children. As the length of time that the mass is present can be helpful in identifying the sinister ones from the more common reactive and benign nodes (Bodenstein and Altman, 1994), frequent review appointments are incorporated within the algorithm to optimize surgical intervention.

Although the strength of this recommendation is low, based on level III evidence (i.e. based on uncontrolled studies or consensus or extrapolated recommendation from evidence from well designed randomized controlled trials, meta-analyses, or systematic reviews, or from well designed cohort or case-control studies; Eccles et al, 1996), this algorithm may be a good starting point for future modification or revision based on further evidence. This may act as a reference for standard medical practice and help recognize the gaps in the evidence on the management of a common clinical issue. For example, the role of FNAC and ultrasonography in the initial assessment and their effectiveness in directing any further management may warrant a prospective study. HM

Conflict of interest: none.

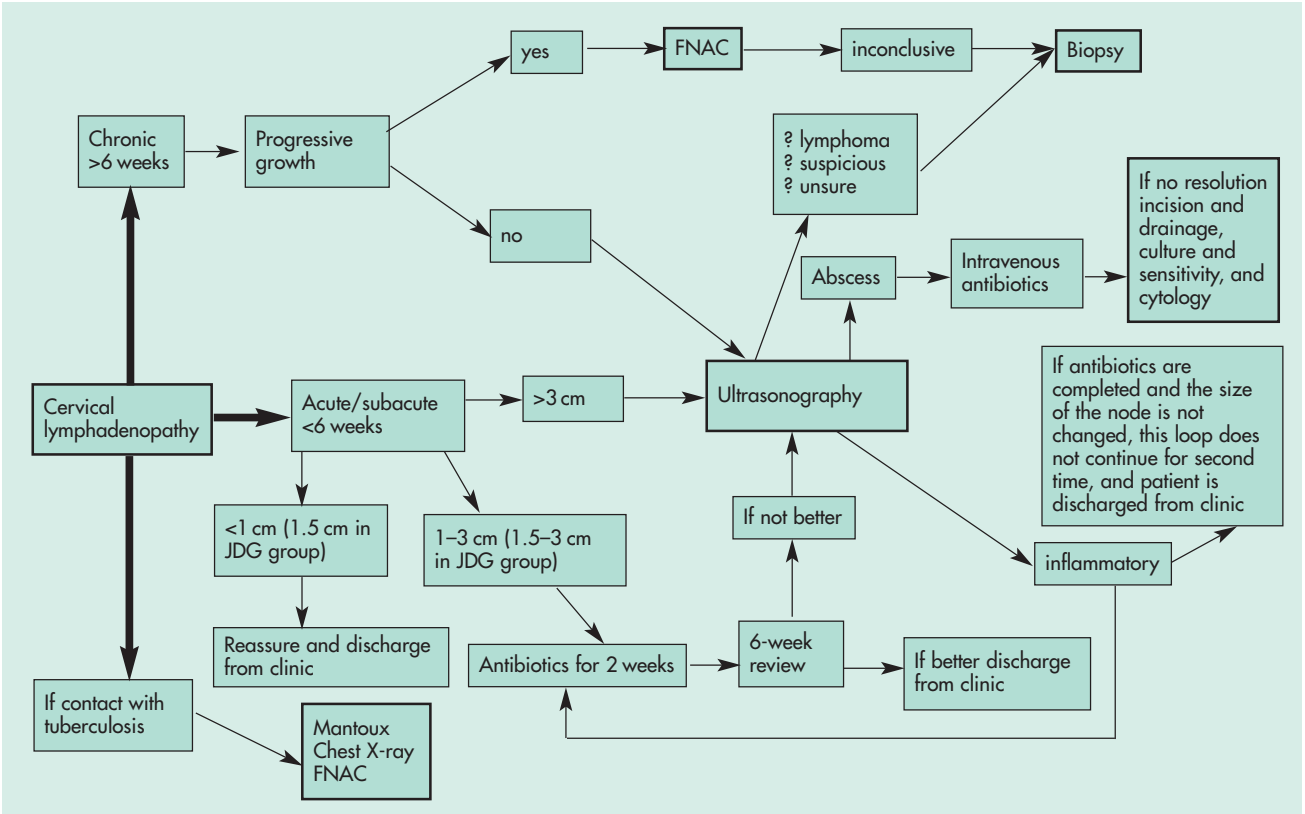
TABLE 4.
Worrying features of a mass

Onset in the neonatal period
Rapid and progressive growth
Skin ulceration
Fixation to skin or deep fascia
Mass larger than 3 cm with firm or hard consistency

KEY POINTS

- A neck lump of over 6 weeks duration that is getting progressively larger should be investigated by fine needle aspiration cytology.
- A neck lump of shorter duration (<6 weeks) that is greater than 3 cm should be investigated by ultrasonography.
- Antibiotics may be prescribed for neck lumps that are present for a short duration (<less than 6 weeks) as inflammatory causes are common.
- If tuberculosis is suspected combined use of chest radiograph, Mantoux test, and fine needle aspiration cytology produce the best diagnostic yield.

Figure 1. Algorithm for the management of cervical lymphadenopathy. FNAC = fine needle aspiration cytology; JDG = jugulodigastric group.



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