Original article:

Clinical and cytohistopathological evaluation of inflammatory skin lesions in and around Muzaffarnagar district

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Abstract:

Introduction : Cytological examination is the initial diagnostic technique for nodular skin lesions which gives the basic preliminary information regarding the pathology of the lesion. The present study was conducted to correlate the clinical diagnosis with cytology and histopathology for the diagnosis of various nodular inflammatory lesions.

Material and methods : Fine needle aspiration cytology of skin lesions. Giemsa staining of cytology smears. Histopathological examination of the lesion, wherever feasible. Special stains eg. Zeihl Neelsen stain, wherever necessary.

Results : Out of total 70 cases of inflammatory lesions cases, FNAC was done in 56 cases. In 42 cases (75%) an accurate diagnosis was made by cytology where as in 14 cases (25%) cases discordant results were seen. Aspiration was insufficient in five cases & wrong diagnosis was made in nine cases. The overall sensitivity was 75%, specificity 96%, positive predictive value was 80% and overall efficiency was 92.30%.

Conclusions : It was observed that FNAC is a very simple and rapid primary procedure which can be performed even in OPD patients. Besides FNAC and histopathology, other procedures which can be used in future to improve diagnostic accuracy including phase contrast microscopy, electron microscopy, immuno-histochemistry, cytogenetic studies and flow cytometry etc. Diagnosis has to be confirmed by histopathological examination.

Key words : FNAC, inflammatory lesions, leprosy, histopathology etc.

Introduction:

Cytopathology of the skin has been documented to be useful in early diagnosis of several skin lesions. Various lesions afflicting the skin range from non-specific dermatosis and inflammatory diseases to neoplastic changes of various component of skin.[1] Cytology and skin biopsy forms the basis of differential diagnosis in clinically similar nodular dermatosis, thereby yielding important information to the pathologist and dermatologist. Slit smears made in cases suspicious of leprosy. [2]

Fine needle aspiration cytology was done in other inflammatory lesions presenting as nodule. Excisional, incisional and punch biopsy were done to obtain tissues for histopathological examination. Sections were routinely stained with Haematoxylin & Eosin, Papanicolaou stain & special stain {AFB}. Skin and subcutaneous nodular lesions are either inflammatory or neoplastic. The classification of as inflammatory lesions & what etiology might produce that type of inflammatory cell response is located on the cytological picture.

Hematomas, sialoceles, cysts, abscesses, granulomas -all can produce masses in the skin a subcutaneous tissues. Cutaneous nodules can develop as a results of benign or malignant proliferation of keratinocytes, melanocytes, dermal structures, metabolic deposits, metastatic neoplasm inflammatory lesions of skin in bacterial viral,

fungal or parasitic. [3] Inflammatory diseases can be of either epidermal appendages mainly Rosacea, Alopecia Arcata, Acne vulgaris, keratosis pilaris. Inflammatory disease of subcutaneous fat – erythema nodosum, erythema induratum, Lipedema, scleremaneonatorum.

Inflammatory diseases of infectious etiology include Bacterial – Impetigo, Pyoderma, Tuberculosis, leprosy, rhinoscleroma & others.

Treponemal – Syphilis, yaws, pinta, Lyme disease.

Fungal disease –Dermatophytosis, Aspergillosis, Blastomycosis.

Viral – Herpes simplex, molluscumcontagiosum, warts.

Parasitic – Scabies, leishmaniasis, cystinosis.

Material and method – Seventy patients were included in the study the cases for the study were taken or selected from the patients attending skin / Surgical OPD'S. Age & sex for the patient site of nodular lesions clinical presentation were recorded. Skin scraping were taken for superficial lesions along with slit smear and FNAC, excisional, incisional & punch biopsy were done to obtain tissues for histopathological examination. For cytological examination, staining was done with routine papanicolaou and giemsa stain, while routine H&E was used for histopathological examination {Clay den 1971}.

Results:

A total of 70 cases were taken for study by cytology & histopathology. FNAC was done in 56 cases. Forty two cases were correctly diagnosed by FNAC. Aspiration was insufficient in 05 cases and wrong diagnosis was made in 09 cases. Age group was taken from first to sixth decade. Youngest patient was 6 year male & oldest patient was 65 year female. Maximum cases were seen in the age group of 31-40 years.

Clinic pathological correlation was done in all cases of various nodular inflammatory lesions which were categorized into Bacterial, Viral, Treponemal & Parasitic. Bacterial lesions outnumbered other lesions with total of fifty lesions. Out of these 42 cases were of leprosy followed by eight cases of lupus vulgaris.

The standard delineation of leprosy follows that of Ridley & Jopling with categories defined along the combination of clinical, microbiological, histopathological & immunological indices- TT (tuberculoid), Boderline and lepromatous. Maximum cases (18) were of LL type, (14) of BL type and (10) of TT type. The classical method for demonstrating leprosy bacilli in lesions is modified Ziehl Nelson stain.

Lepromatous leprosy is the usual macular or infiltrative nodular lesions. Exhibits an extensive cellular infiltrate invariably separated from the flattened epidermis by a narrow grenz zone of normal collagen. There is presence of macrophages having abundant eosinophilic cytoplasm with mixed population of solid & fragmented bacilli. FNAC was done in thirty one cases of leprosy out of which correct diagnosis was made in twenty three cases, wrong diagnosis in five cases along with three cases showing insufficient smear.

Eight cases of the reported inflammatory lesions were of Lupus Vulgaris. In seven cases, FNAC correlated with histopathology. Tuberculoid granulomas composed of epithelioid cells and giant cells are present along with slight caseation necrosis.

In cases of parasitic lesions, 04 cases of cysticercosis & 02 cases of leishmaniasis were reported. FNAC correctly correlated with histopathology in 03 cases of cysticercus and 02 cases of leishmaniasis. FNAC from areas revealed macrophages containing intracytoplasmic amastigotes (Leishman bodies-LD bodies) along with extracellular amastigotes. In histopathology there is an infiltrate of lymphocytes plasma cells &

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histocytes in the upper dermis. Few intracellular LD bodies were also found. Thus diagnostic accuracy was 100%.

Nodular viral skin infections presenting as nonhealing nodular lesions were also recorded. 5 cases of molluscum contagiosum were reported FNAC was done in 4 cases and 3 were correctly diagnosed homogenous inclusion bodies, usually only one in each cell which may be eosinophilic and is quite regular in size was seen.

Discussion

Skin is the largest organ in the body & is the site for variety of skin lesions including inflammatory, tumor-like benign and malignant lesions. The nodular lesions - hamartomatous, inflammatory, reactive and neoplastic that occur in skin are more numerous than those produced by any other organ.

A total of 70 cases were analysed in the present study. Male predominated over female with M: F ratio of 1.7:1 Age group taken was from 1st to 6st decade. Youngest patient was 4 years male & oldest was 65 year.

Among the total 70 cases of inflammatory lesions, most of the cases were of leprosy. Maximum number were of lepromatous type i,e 18 cases followed by 14 cases of borderline leprosy & 10 cases of tuberculoid type. In a study done by Jaiswal et al.(2001)[4]. evaluation of leprosy lesion was done by skin smear cytology in comparision to histopathology.

The overall diagnostic accuracy of fine needle aspiration was 75% & that of skin slit smears was 60%.

2004, Singh et al.[5]. used FNAC to diagnose cases of nodular lepromatous leprosy. Lymphocytes join a major part of smears in the borderline type of leprosy, collection of epithelial cells in one case which was consistent with BT and scanty cellular infiltrates and more foamy macrophages were consistent with LL. Thus it was possible to distinguish tuberculoid type and lepromatous type.

In another observation by Prasad et al (2008)[11] a correlation of clinical feature with FNAC was noticed in 87.5% of TT, 81% of BL and 66% of LL cases, correlation of clinical features with histopathological diagnosis revealed 12.5% specificity in TT leprosy 52.4% in BL and 100% in neuritic & histoid leprosy cases in over study diagnostic accuracy of FNAC for LL was 76.9% borderline lepromatous lesions was 70% and of tuberculoid lesions was 75%. Ferguson (1937) wrote the only advantage of an aspiration biopsy is to differentiate neoplastic from non neoplastic tissue.

In 8 cases of lupus vulgaris 4 cases were seen on the face, similar to Bhambani et al.[7] who also showed lesions on the face in 40% of cases. Raghuveer et al.[8] in their study of 167 cases showed epitholioid granulomas with necrosis in 68.2% of the cases. We also obsereved similar finding in 6 cases. Cytology was helpful in diagnosis of 7 cases of lupus vulgaris as 1 case gave inconclusive results. Histopathological examination in all 8 cases revealed features of lupus vulgaris.

Section of lupus vulgaris shows tuberculous granulomas, most pronounced in upper dermis consisting of epithelioid cells with slight or absent caseation necrosis (Marcoval et al, 1992; Farina et al, 1995)[9] and associated lymphocytic infiltrate. Giant cells are usually Langhans type, some foreign body giant cells may also be seen. There is destruction of cutaneous appendages and extensive fibrosis is seen in areas of healing. Epidermis may show secondary changes in form of atrophy and subsequent ulceration or it may become hyperplastic showing acanthosis hyperkeratosis and papillomatosis. Tubercle bacilli are present in small numbers and can be very rarely demonstrated

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(Lucas, 1997). Culture in lupus vulgaris is frequently negative, only 6% of cases showed positive culture as reported by Horwitz (1959) and Duhra et al (1988).

Kamal et al in 1995.[10] described findings of fine needle aspiration cytology in subcutaneous cysticercosis and their conclusion was that in developing country like India, a rapid safe & reliable cytological diagnosis of subcutaneous cysticercosis by FNAC on an outpatient basis proves to be cost effective procedure since it abates the need for open biopsy.

The viruses of warts are very small and intranuclear (Straus et al 1950, Almeida et al 1962) & manifest themselves in routine only by the presence of stainable nuclei in the showing layer above a thick granular layer the fine points of differentiation were described by Ebert & Otsuka[12] in 1943 with special Reference to elementary & inclusion bodies. Verruca vulgaris usually occurs on hand as an elevated hand rough flesh coloured lesions,[13] verruca plantaris occurs on a role of foot is covered by callus and is after painful (Berman et al in 1977). In our study 5 cases of verruca vulgaris & 4 case of verruca plantaris were reported. Cytologic features exhibited are many infected squamous cells which show large aval vacuoles with homogenous inclusion bodies usually only one in each cell which may be eosinophilic or cyanophilic and is quite regular in size. The histologic characteristic of these lesions are those of focal epidermal hyperplasia manifested by hyperkeratosis and parakeratosis, verying degrees of acanthosis. Distinct vacuolization of the cells in upper portion of the malpighian layer is a features in early lesions.[15]

The Lesions of Molluscum contagiosum characterized by pink or pearly white wart like nodules on the skin. Sections of the lesions show large (20 -30 μ) eosinophilic hyaline inclusion bodies which displace nuclei to the margin, measuring 2 to 4 mm in size with umblicated centre. Lesion may exude curd like substance from its centre when it is fully developed. Ultimately lesions involute spontaneously. The lesions are caused by Molluscum virus, a type of pox virus.

Cytologic features exhibited are many infected squamous cells which show large oval vacuoles with homogenous inclusion bodies usually only one in each cell which may be eosinophilic or cyanophilic and is quite regular in size. The infected cells appear enlarged approximately 20-40 μm in diameter, inclusions fill the cytoplasm pushing the nucleus to cell peripheries.[16]

In histopathology many epidermal cells contain large, intracytoplasmic inclusion bodies called Molluscum bodies, which appear as single minute ovoid eosinophilic structures in lower cells of stratum malpighii at a level one or two layers above basal cell layer but absent in basal layer (Lutzner, 1963)[17].

The infected cells appear enlarged approximately 20-40 μm in diameter, inclusions fill the cytoplasm pushing the nucleus to cell peripheries.[14] Julisbey et al in 1905 confirmed viral nature of contagious material in case of molluscum contagiosum.

Two cases of dermal leishmaniasis were reported. Parasite was found on smear examination both intracellular and extracellular.[18]. Leishmania are phagocytosed induces them to transform into round amastigotes that lack flagella but contain a single large mitochondrion like structure called the kinetoplast [19]. Organisms are found invariably in cytology study as reported by Bhatia, Singh and Arora (1999).

Leishmania organism could invariably be demonstrated on cytology (Bhatia et al, 1999). Smear shows macrophages and epitheloid cells, intermingled with lymphocytes numerous plasma

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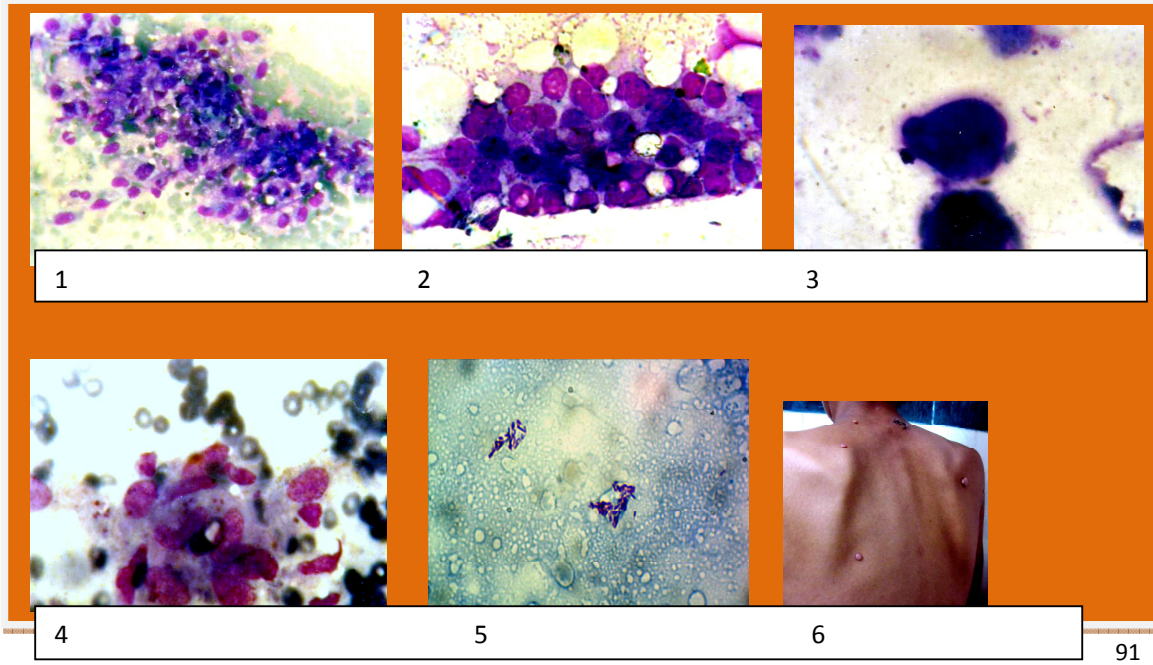
cells and few giant cells leishmania organisms are present within and outside the macrophages. According to wada and Masukawa (1977) smears prepared by expressing central caseous or keratinous core of a molluscum papule yielded good cellularity and higher positivity as compared to FNAC smears. But it was observed that reasonably good material was obtained by FNA during this study.

Sharquie et al in 2002 studied cases of cutaneous leishmaniasis by direct smear, culture and histopathology .this study was conducted to evaluate efficacy of different sampling techniques. These techniques were aspiration of lesion edge, slit scrape method of biopsy.[20].

Conclusion

The study was conducted to correlate the clinical diagnosis with cytology and histopathology for the diagnosis of various nodular inflammatory lesions. Out of total 70 cases of inflammatory lesions cases FNAC was done in 56 cases. In 42 cases (75%) an accurate diagnosis was made by cytology where as in 14 cases (25%) cases discordant results were seen. Aspiration was insufficient in 5 cases & wrong diagnosis was made in 9 cases. It was observed that FNAC is a very simple and rapid procedure which can be performed even in OPD patients. The average time taken to establish the diagnosis is very short. The procedure is easily accepted by the patients, no surgical skill is required and there is no need of anaesthesia. The overall sensitivity was 75%, specificity 96%, positive predictive value was 80% and overall efficiency was 92.30%.In this study, total numbers of cases analyzed were small and diagnostic accuracy could be improved by taking large number of cases for analysis. Besides FNAC and histopathology, other procedures which can be used in future to improve diagnostic accuracy including phase contrast microscopy, electronmicroscopy, immunohistochemistry, cytogenetic studies and flow cytometry etc. FNAC of nodular skin lesions had some considerable limitation, which may be due to poor sampling, poor cellular yield, poor preservation & difficulty in cytological differentiation of atypical benign lesions and well differentiated malignant neoplasms. Diagnosis in these cases had to be relied completely upon histopathological examination.



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