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PATHOGENECITY OF ASPERGILLUS FUMIGATUS IN YOUNG BROILER CHICKS

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SUMMARY

A total of 450 out of 5000 chicks of two-old with a history of repiratory symptoms followed by death 1 to 4 days from onset of signs.From which sixteen of freshly dead chicks were examined at postmortem and mycologically.In addition, experimental infection with isolated Aspergillus fumigatus from naturally infected chicks via contaminated litter were carried out.The clinical findings were recorded including respiratory signs, droopiness, anorexia , watery diarrhea of offensive odour and lack of equilibrium. Also, 0, one, seven, one, two, four and six chicks died on 1, 2, 3, 4, 5, 6, and 7 days post infection respectively. Post mortem examination of freshly dead experimentally infected chicks revealed pneumonia , white yellowish caseous nodules on the lungs and air sac. Mycologically, the cases were diagnosed as infection with Aspergillus fumigatus .

INTRODUCTION

Aspergillosis in chickens is a disease primarily affecting a respiratory tract especially in newly hatched chicks producing brooder pneumonia, which characterized by granulomatous pneumonia and air saculitis (Lee and Edgar, 1980). Usually outbreaks of aspergillosis occur when the organism is present in sufficient quantities to

establish the disease or when the bird resistance is impaired by certain factors such as environmental stress (Redig, et al., 1980) and immunosuppression (Yamada, et al., 1979). *Aspergillus fumigatus* have been determined as the most pathogenic among the causative agents of aspergillosis with widespread resistant spores present in the natural environment (Akan, et al.,1996, 2002; Richard, 1997; Gylstorrff and Grimm, 1998).

An enzootic of chick mycosis with pathological changes were located mainly in the region of the trachea caused by spores of the fungus Aspergillus fumigatus (Veselsky,et al., 1984 and Pal,et al., 1990). In addition, a case of aspergillosis in a broiler flock having respiratory and nervous system problems caused by Aspergillus fumigatus and Aspergillus niger was documented (Akan,et al., 2002).

Therefore, this work was planned to investigate the occurrence of aspergillosis among newly hatched chicks which suffering from respiratory manifestation, and experimental study carried out on chicks , using A.fumigatus which isolated from a naturally infected bird as well as to identify the potential sources of infection.

MATERIAL AND METHODS

A total of 450 out of 5000 chicks of two -old with a history of respiratory symptoms followed by death 1 to 4 days from onset of signs. These birds were reared on free range system and fed on commercial ration. Sixteen of freshly dead chicks were examined postmortem. Also, lung samples were taken under aseptic condition and cultured on Sabouraud s dextrose agar.The plates were incubated at 25°C for 4 - 6 days and observed daily for the growth of colonies. Identification of suspected aspergillus colonies were carried out by macroscopical and direct microscopical examination according to Frey, et al. (1979); Koneman,et al. (1979) and Arda (1981). Lactophenol cotton blue stain was used for the microscopic examination of isolates (Kennedy and Sigler, 1995; Jordan and Pattison, 1996).

Thirty chicks of two-day old obtained from a known hatchery that uses a good hygienic measures and shell of hatching eggs were examined mycologically using swab were put in special cage (60 X 40 X 100 cm) using sawdust as a litter which contaminated with the isolated aspergillus species for 15 minutes. At the same time 10 chicks were used as a control for such experi-

ment. Then both group of chicks were left to grow normally inside poultry house using environmental conditions (temperature, humidity, feeding, watering, ... etc) for such age for 7 days. Chicks were investigated daily for the presence of symptoms and number of death. In addition, dead chicks were examined on autopsy for macroscopical lesions as well as culturing were carried out on Sabouroud's dextrose agar to identify the causative agent.

RESULTS

Clinical findings:

One day after experimental infection of newly hatched chicks with Aspergillus fumigatus isolated from naturally infected chicks , it was found that they were suffering from respiratory manifestations, droopiness, anorexia , watery diarrhea of offensive odour and lack of equilibrium. These symptoms started from 1st day of infection and progressed on subsequent days with nervous signs from 7st day of onset. The died chicks were 0, one, seven, one, two, four and six on the day 1, 2, 3, 4, 5, 6, and 7 respectively.Neither death nor clinical signs of aspergillosis were observed in control group.

Postmortem examination:

Post mortem examination of freshly dead experimentally infected chicks revealed pneumonia (Fig.1), white yellowish caseous nodules were observed on the lungs (Fig., 2) and air sac .

Mycological examination:

Culturing of the lung samples collected during postmortem examination of dead chickens revealed isolation of blue-green colonies which examined microscopically and diagnosed as A.fumigatus . On the other hand, no mycological finding were observed in the control group.

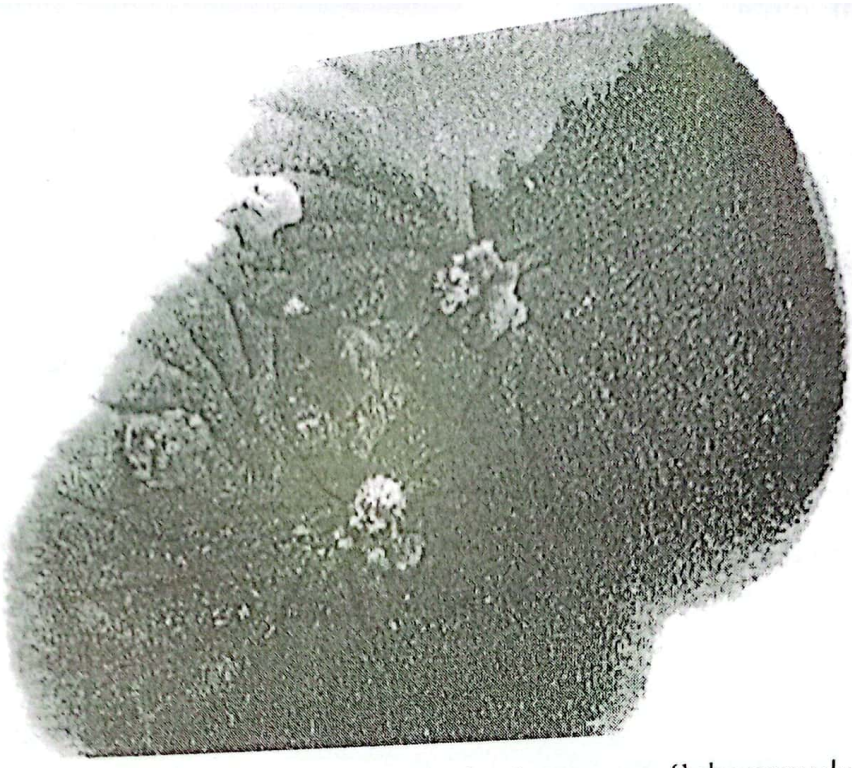

Fig. (1): Growth of *Aspegillus fumigatus* on Sabourouds dextrose agar.

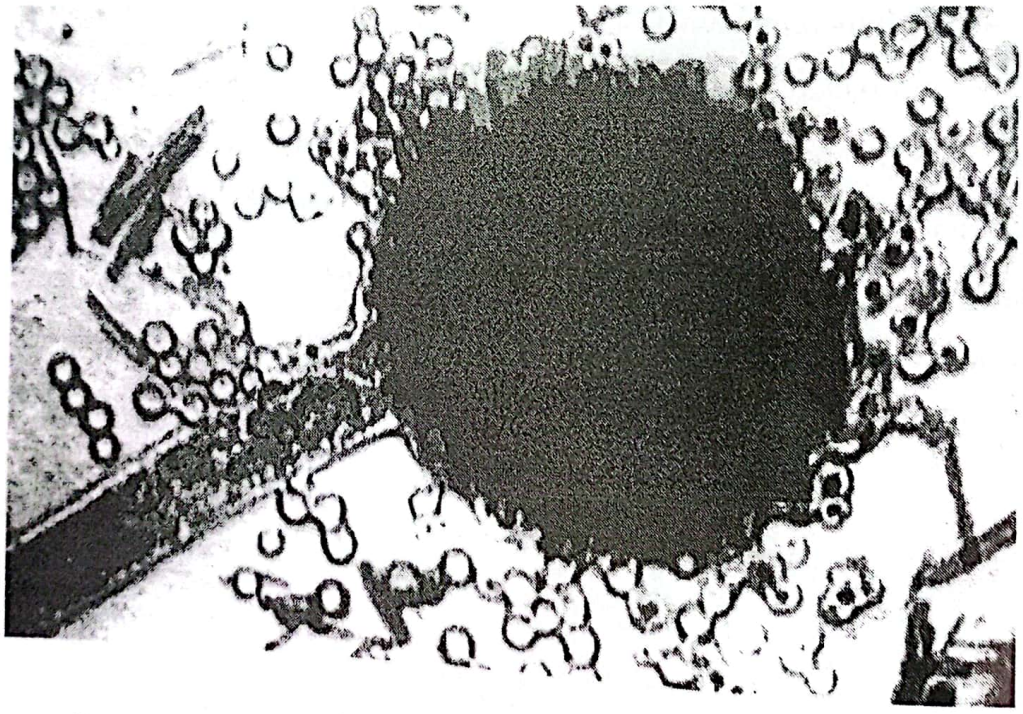

Fig. (2): Microscopical examination of *Aspegillus fumigatus*

DISCUSSION

Aspergillosis might led to high economic losses through egg spoilage, lowering hatchability percentage, increased dead- in - shell embryos and considerable losses in young birds (Saif and Aboul-kheir, 1979, Barton,et al.,1992 and Akan, et al., 2002). Moreover, Okoye, et al. (1989) demonstrated that Aspergillus fumigatus infection of poultry was characterized by gasping, droopiness, emaciation and heavy mortality. Our clinical finding agree with manifestations recorded by Lee and Edgar (1980); Okoye,et al. (1989) and Akan, et al. (2002).

Postmortem examination of freshly dead experimentally infected chicks revealed pneumonia ; white yellowish caseous nodules on the lungs and air sac which agree with those reported by Okoye, et al. (1989) and Akan, et al. (2002). Moreover, the morphological features of fungal hyphae and spores recovered from lungs of experimentally infected chicks contribute to the diagnosis of Aspergillus fumigatus and the organism was thmain aetiological agent for such problem.

It can be concluded that Aspergillus fumigatus have a health hazard in newly hatched chicks leading to serious symptoms and may be followed by death. In addition, hatcheries, litter and feed contaminated with Aspergillus fumigatus were considered as the suggested sources of infection. So, hygienic measures should be applied including periodical disinfection of hatcheries and using litter and feed of good quality free from fungal contamination.

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