

**A Study on Omphalitis in Newly Born Chicks**



**Medical Science**

**KEYWORDS :**

**Shringi A.**

**Mandovera V.**

**Pachoury R.**

**Godara A.**

**ABSTRACT**

*This investigation was done in a poultry farm with capacity of 10000 birds to identify the causative organism of death in newly born chicks. In this study 30 percent mortality was found in newly born chicks. Main cause of deaths was yolk sac infection, called as Omphalitis. Samples were taken and bacterial isolation was done from yolk samples the main bacterial growth found was E. coli a colliform. Colliform bacteria are not generally pathological, but in these cases bacteria became virulent because of many predisposing factors at farm viz: optimal temperature, immuno-suppression of birds and high humidity. As per studies sanitation, cleaning and hygienic condition of incubators play an important role in survival of chicks.*

**Introduction**

Omphalitis is a condition characterized by infected yolk sacs, often accompanied by unhealed navels in young fowl. It is infectious but noncontagious and associated with excessive humidity and marked contamination of the hatching eggs or incubator.( Merk’s manual).

A major cause of increased first-week chick mortality is omphalitis, or navel-yolk sac infection : a hatchery-born disease also known as ‘**mushy chick disease**’ and ‘navel ill’( Merks Manual ).

The affected chicks usually appear normal until a few hours before death. Depression, drooping of the head, and huddling near the heat source usually are the only signs.( Pasreform .com 2011 ).

Post mortem examination reveals discoloration around the navel and an inflamed yolk sac with distended blood vessels, together with an offensive odor.

Samples were collected form dead day old chicks, aseptically with the help of sterile cotton swabs soaked in normal saline solution and were placed in sterile tubes, taking all precautions to avoid contamination. It was transported to laboratory as soon as possible for further processing.

**Bacterial (E.coli) isolation:-**

The procedure for isolation and identification of bacterial cultures was adopted in the study as per technique of **Cowan and Steel (1975)**. Samples were inoculated in **nutrient broth** and incubated for 24 hours at 37°C. A loopful of material from nutrient broth was streaked upon Mackonkey Agar (MLA) plates and the plates were incubated at 37°C for 24 hours. After 24 hour’s incubation lactose fermenter (Fig.3) and non lactose fermenter colonies were processed as per technique of **Edward and Ewing (1986)** and cultures which showed typical **metallic sheen on EMB agar** (Fig. 4) were subjected to the biochemical reactions for further confirmation. These purified cultures were inoculated on nutrient agar slants and incubated at 37°C for 24 hours.



**Fig: Photo showing retained yolk on post mortem.**



**Fig: Photo showing yolk sac with distended blood vessels.**  
**Etiology**



**Fig:3 Pink colonies shows lactose fermenters on MCA Plates**



**Fig:4 Metallic green sheen on EM plates confirm presence of E.coli.**

After processing isolates through above described primary and secondary biochemical processes we have got following inferences.

Primary tests	Reaction
Gram's reaction	Gram Negative
Morphology	Rod shaped
Motility test (Hanging drop)	Motile
Catalase test	Positive
Oxidase test	Negative
Growth on Mac konkey agar	Pink colonies
Secondary test	Reaction
Growth on EMB agar	Green metallic sheen
Growth on TSI agar slants	Acid/Acid/No H <sub>2</sub> S(Y/Y/-)
Indole test	Positive
Methyl red	Positive
Voges-Proskauer test	Negative
Citrate utilization test	Negative

### Result and Discussion

Opportunistic bacteria (coliforms, staphylococci, *Pseudomonas* spp, and *Proteus* spp) are often involved, and mixed infections are common. Proteolytic bacteria are prevalent in outbreaks. The yolk sac is not absorbed and often is highly congested or may contain solidified pieces of yolk material; peritonitis may be extensive. Edema of the sternal subcutis may be seen. Mortality often begins at hatching and continues to 10-14 days of age, with losses up to **15% in chickens and 50% in turkeys**. Chilling or overheating during shipment may increase losses. Persistent, unabsorbed, infected yolks often produce chicks or poults with reduced weight gain.(Kehler L.,2008)

For omphalitis to occur, causative bacteria and a route of entry into the yolk sac must be present.

Chicks are not born into a sterile environment. The likelihood of omphalitis developing is much higher in a batch of eggs that includes bangers, or if the hatcher baskets are not thoroughly cleaned and disinfected prior to transfer. Infection pressures can be effectively reduced by good hygiene practice.

### Treatment and Advices

**There is no specific treatment;** antibiotic use is based on the prevalent bacterial type involved, but is probably of little value. The disease is prevented by careful control of temperature, humidity, and sanitation in the incubator. Only clean, uncracked eggs should be set. If it is necessary to set dirty eggs, they

should be segregated from clean eggs. Sanitizing detergents must be used according to directions if eggs are washed. Time, temperature, and frequent changes of water are as critical as the concentration of sanitizer in both wash and rinse water. The rinse should be warmer than the wash water (which should be warmer than the internal temperature of the egg), but should not be >60°C.

The incubator should be cleaned and disinfected thoroughly between hatches. If fumigation is to be done with formaldehyde, vents should be closed. Thirty ml of 40% formaldehyde per 0.6 m<sup>3</sup>, or Para formaldehyde (in the strength recommended by the manufacturer), should be allowed to evaporate in the closed incubator or hatcher. The machines are readily contaminated after fumigation unless the exterior of the machines and the rooms in which they are located are cleaned and disinfected.(www. Pars-form.com). With optimal incubation, chicks will normally hatch with properly healed navels. In some cases, although the navel may be slightly open at hatching, it should close naturally within a couple of hours, while the chicks are drying. In this scenario, the incidence of omphalitis is minimal.(Merks Manual 2010).

However, if the navel shows any deformity, it creates a point of entry for bacteria. Nutrients in the yolk combined with the body temperature of the chick will produce rapid bacterial multiplication. Maternally derived immunity will not offer sufficient protection against this invasive challenge while the chick's own immune system is still immature.

There can be several reasons for increased incidence of navel deformity. '**Black button**' navels are caused by incubation temperatures being set too high, especially during the last days of the cycle. Temperatures that are too low during the final days of incubation will produce poorly closed navels. (Merks Manual 2010).

Overly high humidity during incubation results in insufficient weight loss. As a result, the residual yolk sac becomes enlarged, which prevents the navel from closing properly. Conversely, when humidity is too low, the yolk sac dehydrates and becomes hard, which can damage sensitive tissue around the navel. (Giovanardi, et al. 2005)

When eggs are stored for prolonged periods prior to incubation, more chicks with black scab navels are observed, indicating unhealed navels at the moment of hatching.

The standard use of antibiotics to prevent omphalitis is not a sustainable solution and should be discouraged.

### Advices

- Maintain thorough hygiene, from laying nest to setter, to minimize the incidence of contaminated eggs.
- Avoid eggs becoming wet, e.g. by sweating, as this results in bacterial penetration.
- Clean and disinfect setters and hatcher, trays and baskets, transfer equipment etc. thoroughly after every use.
- Ensure hatcher baskets are completely dry before transfer, to minimize the risk of bacterial penetration through the pores.
- Consider fumigating the hatcher after transfer if a batch of eggs contains 'bangers'. (Merks Manual 2010).
- Aim to produce day old chicks without navel deformities by optimizing incubation conditions that take breed, maternal age and duration of storage into consideration.
- Target the narrowest hatch window possible – and do not pull chicks while some are still wet, as these are still likely to have slightly unclosed navels.
- Handle chicks under optimal climatic conditions from the moment of pulling until their placement on the farm, to avoid chilling or overheating, as either will be detrimental to the chicks' immune status and yolk sac resorption. (Huff, W. et al.2002)
- Stimulate feed intake as soon as the chicks arrive at the farm, to accelerate yolk sac resorption.

**REFERENCE**

Allen, B. et al. Characterization of *Escherichia coli* isolated from cases of avian colibacillosis. *Veterinary infectious diseases organization. Canadian Journal of veterinary Research* July 1993;57(3):146-151. | Ghanbarpour R. and Salehi M.(2010): Determination of Adhesin Encoding Genes in *Escherichia coli* Isolates from Omphalitis of Chicks. *American Journal of Animal and Veterinary Sciences*,5(2):91-96. | Giovannadi et al. Avian pathogenic *E.coli* transmission from broiler breeders to their progeny in integrated poultry production chain, *Avian pathology* 2005. 34(4):313-318. | Huff, W. et al. prevention of *Escherichia coli* infection in broiler chickens with bacteriophage aerosol spray *poultry Science* 2002. | Kehler L,(2008) *Canadian poultry*, [www.canadianpoultry.com](http://www.canadianpoultry.com). | Khan K.A, Khan S.A, Aslam A, Rabbani M. and Tipu M. Y. (2004): Factors contributing to yolk retention in poultry: A Review. *Pakistan vet J*, 24(1):46-50. | *Merk's Veterinary Manual* 2010 | [www.paserform.com](http://www.paserform.com) 13/03/2013 | [www.backyardchickens.com](http://www.backyardchickens.com) 02/03/2013 | [www.helium.com.../vets & pet health](http://www.helium.com.../vets & pet health) 20/02/2013 |