Iraqi Journal of Biotechnology, 2025, Vol. 24, No. 3, 283-287

Detection of Virulence Genes (iap) in Listeria Monocytogenes in Children and Pregnant Women in Baghdad's Hospitals

[1]Mawj ziyad mohammed, [2]Wasan A. Garbi ,

[1]Institute of Genetic Engineering and Biotechnology for postgraduate studies, University of Baghdad, Iraq
[2]Central veterinary laboratory

Received: July 22, 2024 / Accepted: July 31, 2024 / Published: November 3, 2025

Abstract : Studying listeriosis is important to find out what the disease does to pregnant women and newborns and how dangerous it is for them and virulence gene that important know what the affect of it. The gene responsible for the encoding part of Listeria monocytogenes EGD has been successfully isolated and its sequence has been determined. The gene was called IAP (invasion-associated protein) because of its potential to participate in invasion. The IAP gene encodes a polypeptide that has a total of 484 amino acids, including a 27-amino-acid signal peptide. This signal sequence triggers the production of a 47.5 kDa polypeptide that is considered to be mature. The analysis of the deduced amino acid sequence showed that p60 is a protein that possesses basic properties (the iselectric point of 9.3) and includes a domain that is composed of 19 Thr-Asn repeats. Both DNA-based hybridization tests and immunological analyses demonstrated the presence of genes associated with IAP and related proteins in all of the tested Listeria species (9, 9a, 33). PrfA lacks control over the IAP gene. Recently, it was demonstrated that the control of IAP expression is posttranscriptional, as evidenced by Wuenscher's team. in 1993.

Keywords: virulence genes, *Listeria monocytogenes*, children, pregnant women

Corresponding author:(Email:Mawjmooja@gmail.com**)**

Introduction

Listeriosis caused by *Listeria monocytogenes,* is one of the important bacterial zoonotic infections worldwide [1] .[2] This results in severe, life-threatening infection that primarily affects high-risk groups, including pregnant women, newborns, elderly patients, and patients with a compromised immune system. [3] ,[4] Research results indicate that the frequency of listeriosis is 20 times greater in pregnant women than it is in the general population. [5] [6].. Pregnant women have a heightened susceptibility to infection, and the presence of hidden or obvious bacteria in the bloodstream can lead to chorioamnionitis, which in turn can cause early-onset newborn listeriosis [7] , [8], [9].

The aim of study

detection of virulence gene (iap) in listeria monocytogene in children and pregnant women isolated from Baghdad hospitals

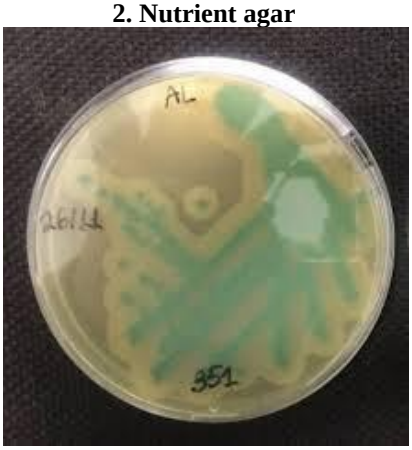
Materials and method

After visiting three hospitals in Baghdad, which were Al-Alawiya Maternity Hospital, the Medical City,

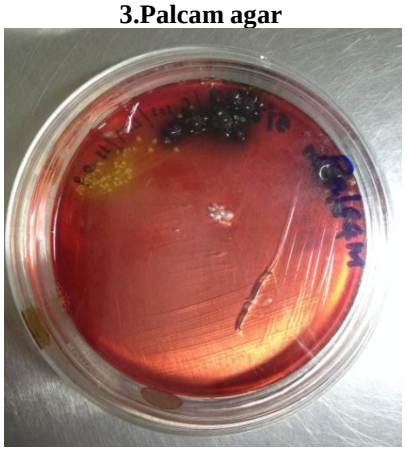
and Al-Kadhimiya Hospital, 200 samples were collected, 100 of which were from infected women and children, 50 from women and 50 from children, and 100 of them from uninfected women and children, 50 from women and 50 from children. Finding the bacteria was very difficult, as it was attempted many times. Samples were collected in large numbers until suspicious samples were obtained and sent to the laboratory for testing, the samples were taken with swab and incubated for 24 hours and then began cultured

1. Blood agar

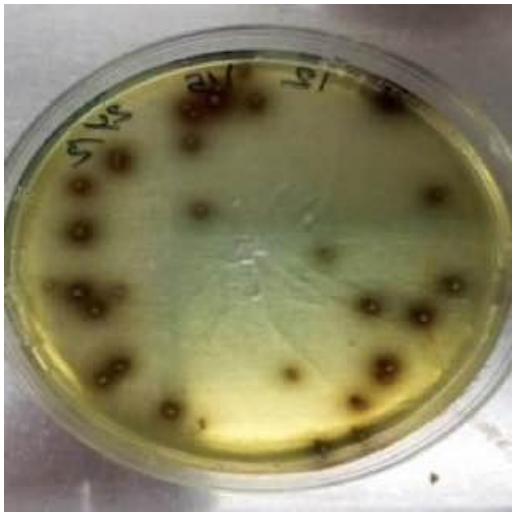
2. Nutrient agar



3.Palcam agar



4. MOX agar



5. Catalase test

6. Oxidase test

7. TSI

DNA Extraction

DNA extraction of *Listeria monocytogenes* was done using BioBasic DNA extraction kit.

Detection gene by PCR

DNA extraction of Listeria monocytogenes was done using BioBasicDNA extraction kit

Table (1): Primers used in PCR

Primers	Sequence	Product length	Reference
Iap	F: 5`- CAAACTGCTAACACAGCTACT -3` R: 5`- GCACTTGAATTGCTCTTATTG -3`	371 bp	(Kumar et al., 2015)

Results and discussion

The samples were collected (200 samples) 100 samples control 50 for women and 50 for children, 100 samples listeriosis 50 for women and 50 for children, in control samples the result was negative and the diseased samples were positive.

Test	Result
Blood agar	The colonies that look smooth, small colonies with gray coulores
Nutrient agar	bluish gray colonies
PLACAM medium	Black colonies with black zone surronding
MOX medium	Black colonies with black zone surronding
Gram stainig	+
Catalase	+
Oxidase	_
TSI	fermentative in sugars and producing acid without gas

Conclusions

1. Due to developing in food industry(increased canned food and L.M
2. Several cases of L.M infection were underestimation because of gynecologocal treatment protocol.
3. Existance of the gene in all pathogen strain give audience of it’s rol in pathoginicity and invasion the host cell
4. Using multiplex PCR in avery suitable toll for quantification of the gene

Recommendations

1. Screening all pregnant women especially 1sttimister for the bacteria
2. Examination of abortive, miscarage, still birth sample from bacteria
3. Developing anew and easy technique to detect the bacteria in pregnant women urine (blotting)
4. Screening of poultry and dairy for the LM
5. Study thee xistance of the gene in

non pathogenic strain analysis of variance for data of virulence genes values independent t-test, Dunnett's test at a5% level of significance. Moreover, all frequency data was analyzed by Pearson's chi-squared test and Fisher's exact test. Data were processed and analyzed by using statistical program social science (SPSS-v 26)2019 and the results .

References

1. Bayleyegn M, Roman Y., &Daniel A.(2004). *Listeria monocytogenes and other Listeria species in retail meat and milk products in Addis Ababa, Ethiopia*. Ethiop J Health Dev. 18(3):1–
2. Aseel M. Hamzah.(n.d). *Production of specific brucellin to diagnose Brucellosis*. Baghdad Journal of Science 10 Volumes .Zoonotic disease unit, Vet. Med.-Baghdad University.
3. Morvan A., Moubareck. C., Leclercq A., Herve-Bazin, M, Bremont S, et al. (2010). *Antimicrobial resistance of Listeria monocytogenes strains isolated from humans in France.* Antimicrob Agents Chemother. 54(6):2728–31.
4. Alsaqee, A.H. (2022). Serum Lipids Deregulation in Neonatal Sepsis. Medical Journal of Babylon 19(1):p 66-70 (https://journals.lww.com/mjby/toc/2022/19010)
5. Welekidan, L. N., Bahta, Y. W., Teklehaimanot, M. G., Abay, G. K., Wasihun, A. G., Dejene, T. A., ... & Hagos, A. K. (2019). *Prevalence and drug resistance pattern of Listeria monocytogenes among pregnant women in Tigray region, Northern Ethiopia: a cross-sectional study*. BMC research notes, 12, 1-6.
6. Fathi, I.A.(2019). *Surveillance for Contamination of Salad with Listeria Monocytogenes in Some of Baghdad Restaurants*. AL-Kindy College Medical Journal Vol.15 (2) (https://jkmc.uobaghdad.edu.iq/index.php/MEDICAL/issue/view/10)
7. Wuenscher, M. D., Köhler, S., Bubert, A. N. D. R. E. A. S., Gerike, U., & Goebel, W. (1993). *The iap gene of Listeria monocytogenes is essential for cell viability, and its gene product*, p60, has bacteriolytic activity. Journal of bacteriology, 175(11), 3491-3501.
8. Hiba. H. H. Ghaima, K. K.,& Qader, D. S. (2024). *ISOLATION AND CHARACTERIZATION OF LISTERIA MONOCYTOGENES FROM SOME IRAQI MISCARRIAGE WOMEN*, Iraqi Journal of Agricultural Sciences – 55(1):322- 328.
9. Karm I. F. A. (2019). *Investigation of active compound in clove (Syzygium Aromaticum) extract and compared with inhibitors of growthof some types of bacteria causing food poisoning*. Iraqi Journal of Agricultural Sciences. 50(6):1645-1651.