

## BREAST FEEDING AS A PROTECTIVE FACTOR AGAINST OTITIS MEDIA IN THI-QAR

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### الرضاعة الطبيعية كعامل وقائي للحماية من التهاب الأذن الوسطى لدى أطفال ذي قار

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نظرياً، لكي تُحدّد تأثيرات الرضاعة الطبيعية من الصدر كُلَّ التأثيرات المفيدة والتأثيرات الضارّة لـكُلَّ مادة في الحليب الإنساني يجُبُ أنْ يُقارنَ بـكُلَّ التأثيرات المفيدة والضارة الحليب الاصطناعي. على أية حال، دراسات على تأثيرات الصحة لـكُلَّ مُرْكَبٍ في الحليب الإنساني وفي الرضاعة الصناعية ليست متوفرة.

لذلك اجريت هذه الدراسة الويبائية المتقطعة التحليلية المقطعية التي امتدت من الإسبوع الأول من أكتوبر/تشرين الأول ٢٠٠٩ حتى الإسبوع الأخير من فبراير/شباط ٢٠١٠.

الدراسة اجريت على ١١٠ طفل لعمر أقل من سنتين، وكانت النتائج كالتالي: الأشخاص الأكثر شيوعاً من حدوث التهاب الأذن الوسطى الحادّة كان أكثر بين أطفال العمر أقل من سنة ١، حضرية، ذكر، من الأم العاطلة، المتعلمة ورضاعة اصطناعية. بينما المُزمن بشكل رئيسي بين ١ - سنتين، غير موظفة، ذكر حضرية. المنزلة التربوية للأم والمُختلطة والقنية تغذى لها نفس النسب المئوية.

المتغير المستقل الذي يؤثّر على حدوث التهاب الأذن الوسطى نوع إطعام {إطعام صدر وقائي}. من وجهة نظر إبقاء آذان صحّية وتفادي إصابات التهاب الأذن الوسطى أو الأخرى، تُرجّح من الصدر أفضل للأطفال. كما بشكل واضح، كما يتضح اذا كانت الامهات لا تستطيع ارضاع اطفالهن طبعاً فمن الضروري استخدام الاصوات الصدرية بواسطة القناني لغرض منع انكماس حلمة الثدي لدى الامهات وتشكيل قفاعة الهواء في اذن الطفل

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#### **Abstract**

Acute Otitis Media is extremely common in children – in fact, 75% of children have at least one episode by one year of age.

Theoretically, in order to quantify the health effects of breastfeeding all beneficial effects and harmful effects of each substance in human milk should be compared with all beneficial and harmful effects of formula feeding. However, studies on the health effects for each compound in human milk and in formula are not available.

So a cross sectional analytical epidemiological study extended from the 1<sup>st</sup> week of October 2009 till the last week of February 2010.

The finding of the researchers was as follow: The most common characters of occurrence of acute otitis media was more among children of age less than 1 year, urban, male, of unemployed mother, educated mother and bottle feeding. While chronic Otitis Media is mainly among 1- yrs, urban, male, non employed. Educational status of the mother and mixed and bottle feeding has the same percentages.

The independent variable which affect the occurrence of Otitis Media is type of feeding {breast feeding is protective}.

From the point of view of keeping ears healthy and avoiding otitis media and other infections, breast-feeding is best for infants. Just as clearly, if parents cannot breast feed, it is critical to use feeding bottles that are designed to prevent nipple collapse and air bubble formation.

### **Introduction:**

The World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding from birth until the first six months of life and sustained breastfeeding together with adequate complimentary foods thereafter for up to two years of age or beyond.<sup>1</sup> Human milk is a complex mixture of many substances produced by the mother's body, such as lipids, proteins, antibodies, hormones, vitamins, minerals and nucleotides. Additionally, substances introduced to the mother's body by ingestion of food, drink, pharmaceutical agents, drugs or inhalation of chemicals or via dermal exposure can also be found in human milk. Some of these substances have possible beneficial effects other possible harmful effects.<sup>2</sup> Theoretically, in order to quantify the health effects of breastfeeding all beneficial effects and harmful effects of each substance in human milk should be compared with all beneficial and harmful effects of formula feeding. However, studies on the health effects for each compound in human milk and in formula are not available.<sup>3</sup> Bottle-feeding is associated with many medical risks: cow-milk allergy and intolerance<sup>4</sup>, increased risk of respiratory and gastrointestinal diseases<sup>5-8</sup>, high incidence of otitisMedia<sup>9</sup>.

AOM is extremely common in children – in fact, 75% of children have at least one episode by one year of age<sup>10</sup>. The primary defect leading to AOM is eustachian tube dysfunction and obstruction. Compared with adults, children are predisposed to AOM because their eustachian tubes are shorter, more horizontal and more prone to obstruction by enlarged adenoids<sup>11,12</sup>. Furthermore, viral infections and allergies are common in young children, and both can cause eustachian tube inflammation<sup>13,14</sup>. Finally, children (especially those with recurrent otitis media) may have decreased levels of secretory immunoglobulin A – an antibody that decreases bacterial adherence in the nasopharynx<sup>15</sup>. Once the eustachian tube is obstructed, two things happen. First, mucociliary clearance is impaired, trapping mucus in the middle ear space<sup>16</sup>. Second, resorption of gases within the middle ear space creates a pressure differential, akin to a vacuum, which pulls bacteria from the nasopharynx into the middle ear space. Once introduced into this space, bacteria can proliferate and may cause secondary infection. Thus, it is rare to develop AOM without an antecedent viral upper respiratory tract infection, with AOM typically developing after several days of viral symptoms.<sup>16</sup>

The child with Otitis media presents with a mild cough and cold followed by pain in the ear or, in young infants, with continuous, excessive unexplained crying. Otoscopy reveals an inflamed, bulging ear drum.<sup>16</sup>

**Table 1: The signs or symptoms that must be present to make a diagnosis of acute otitis media & Signs of a middle ear effusion:**

- An immobile tympanic membrane (as demonstrated by pneumatic insufflation, tympanogram or acoustic reflectometry) or presence of liquid in the external ear canal as a result of tympanic membrane rupture (acute otorrhea)
- +/- Opacification of the tympanic membrane (not secondary to scarring)
- +/- Loss of the bony landmarks behind the tympanic membrane (specifically loss of the short or lateral process of the malleus)
- +/- A visible air fluid level behind the tympanic membrane

**Signs of middle ear inflammation:**

- Bulging tympanic membrane with marked discolouration (hemorrhagic, red, gray or yellow)

**acute onset of symptoms:**

- Rapid onset of ear pain (otalgia), or unexplained irritability in a preverbal child

Data are adapted from references<sup>17-27</sup>

Use **antibiotics** judiciously. The antibiotic commonly used for the initial treatment of acute otitis media is amoxicillin, if the patient does not respond to initial therapy within 24 to 72 hours, consider switching to a different limited-spectrum antibiotic or to a broader-spectrum antibiotic (e.g., amoxicillin and clavulanate, azithromycin). If the patient does not respond after two to three full courses of antibiotics, consider evaluation by an otolaryngologist for myringotomy or tympanocentesis to isolate the pathogen and drain the infection. Prophylaxis with antibiotics is controversial and, if used, should be reserved for control of recurrent acute otitis media (three or more well documented episodes in 6 months or four episodes in 12 months). Amoxicillin or sulfisoxazole can be prescribed once a day for 3 to 6 months.<sup>28</sup>

Chronic suppurative otitis media (CSOM) is the result of an initial episode of acute otitis media and is characterized by a persistent discharge from the middle ear through a tympanic perforation. It is an important cause of preventable hearing loss .Generally patients with tympanic perforations which continue to discharge mucoid material for periods of from 6 weeks<sup>29</sup> to 3 months, despite medical

treatment, are recognized as CSOM cases. The WHO definition requires only 2 weeks of otorrhoea,<sup>30</sup> but otolaryngologists tend to adopt a longer duration, e.g. more than 3 months of active disease<sup>31</sup>

CSOM can also be differentiated from AOM on bacteriological grounds. In AOM the bacteria found in the middle ear include *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Haemophilus influenzae* and *Micrococcus catarrhalis*. These are respiratory pathogens that may have been insufflated from the nasopharynx into the middle ear through the Eustachian tube during bouts of upper respiratory infections. In CSOM the bacteria may be aerobic (e.g. *Pseudomonas aeruginosa*, *Escherichia coli*, *S.*

*aureus*, *Streptococcus pyogenes*, *Proteus mirabilis*, *Klebsiella* species) or anaerobic (e.g.*Bacteroides*, *Peptostreptococcus*, *Propriionibacterium*)<sup>32,33,34</sup>. The bacteria are infrequently found in the skin of the external canal, but may proliferate in the presence of trauma,inflammation,lacerations or highhumidity<sup>35</sup>. These bacteria may then gain entry to the middle ear through a chronic perforation<sup>36</sup>. Ear swab for culture and sensitivity test should be done before empirical treatment with anti-gram negative antibiotics start ,topical as well as systemic antibiotics are recommended for CSOM.<sup>37</sup>

**Methodology:**

**Study design**

A cross sectional analytical epidemiological study extended from the 1<sup>st</sup> week of October 2009 till the last week of February 2010.

**Target population:**

Each under two year patient with ENT problem attending the outpatient unite of the ENT department in Al-Habboby general hospital.

**Place of study:**

Outpatient unite of the ENT department in Al-Habboby general hospital in Al-Nasseriyah city.

**Tools of study:** A form of questionnaire was prepared by ENT specialist physician, community physician and pediatrician, which was include name, age, sex, address, occupation of the mother, employment of the mother and the type of feeding of infected child.Auroscopicexamination was done by ENT specialist physician to diagnose and determine the type of otitis media.

**Pilot study:**

A pilot study was conducted first to test the feasibility of the study and the time required to complete it, in addition to having an idea about the possible number of patient checked per unit of time. The results of the pre-test were studied. Then, the modifications and final decisions were made.

**Official endorsement:**

Permission was sought from the general directorate of health in Thi-qar, manager of Al-Habboby general hospital as a verbal consent.

**Variables:**

Age was classified into two groups {less than 1 year and 1-2 years}, address {rural and urban}, occupation{employed, unemployed}, educational status{educated, non}, sex {male, females}, types of feeding {breast, bottle and mixed} and lastly the type of otitis media {acute and chronic}.

**Statistical analysis:**

Analysis of variable done statistically by using computerized program-SPSS(Statistical Package of Social Sciences version 17), by which the researcher estimate the numbers, their percentages, chi-square, P values and logistic regression.

**Distribution of Socio-demographic characters of under two years children according to type of otitis media**

characters	No. of A.O.M	percent	No. of C.O.M	percent	total	percent	X <sup>2</sup> - P value
<b>Age of under two years children</b>							
Less than 1 yr	57	63.3	9	45	66	60	2.292 <sup>a</sup> <b>0.104</b>
1-2	33	36.7	11	55	44	40	
Rural	22	24.4	7	35	29	26.4	.939 <sup>a</sup> <b>0.241</b>
Urban	68	75.6	13	65	81	73.6	
<b>Sex</b>							
Male	53	58.8	11	55	64	58.2	.102 <b>0.469</b>
Females	37	41.2	9	45	46	41.8	
<b>Mother's Occupation</b>							
Employed	23	25.5	4	20	27	24.5	.273 <sup>a</sup> <b>0.419</b>
Non	67	74.5	16	80	83	75.5	
<b>Educational status of the mother</b>							
Educated	52	57.7	10	50	62	56.3	4.785 <sup>a</sup> <b>0.091</b>
non	38	42.3	10	50	48	43.7	
<b>Type of feeding of under 2 yrs children</b>							
Breast fed	32	35.6	4	20	36	32.7	4.053 <sup>a</sup> <b>0.05</b>
Bottle fed	40	44.4	8	40	48	43.6	
Mixed	18	20	8	40	36	32.7	
<b>total</b>	<b>90</b>	<b>100</b>	<b>20</b>	<b>100</b>	<b>110</b>	<b>100</b>	

The most common characters of occurrence of acute otitis media was more among children of age less than 1 year, urban, male, of unemployed mother, educated mother and bottle feeding. While chronic O.M is mainly among 1- yrs, urban, male, non employed. Educational status of the mother and mixed and bottle feeding has the same percentages.

**Table 2**  
Logistic regression analysis of independent variables in relation to occurrence of otitis media

**Variables in the Equation**

<b>characters</b>	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Exp(B)</b>
<b>age</b>	.764	.522	2.147	1	.143	2.147
<b>adress</b>	-.470-	.576	.666	1	.414	.625
<b>sex</b>	.324	.538	.363	1	.547	1.383
<b>occupation</b>	.183	.738	.062	1	.804	1.201
<b>education</b>	.564	.561	1.013	1	.314	1.758
<b>feeding</b>	.767	.358	4.575	1	.032	2.153
<b>Constant</b>	-5.756-	2.617	4.837	1	.028	.003

The independent variable which affect the occurrence of O.M is type of feeding {breast feeding is protective}

**Discussion:**

There is convincing evidence that breastfeeding has a beneficial effect on *gastrointestinal infections* and consequently on the prevalence of diarrhoea. Also for the protective effect of breastfeeding against *otitis media* (ear infections) is convincing evidence. Although, there is only possible evidence for recurrent otitis media. Colostrums, first milk after birth, in particular is thought to be responsible for these effects. It contains a high concentration of secretory IgA, which may protect through the enteromammary and bronchomammary pathways.<sup>3</sup>

Occurrence of acute otitis media in this study was more among children less than one year of age (63.3%) this might be due to the fact that immunity has not been fully developed , male occupied (58.8%)of the population in this study coincide with dr.ThamerK.Yosif, et.al(2006),while against them in the residency.<sup>38</sup>

Educated (57.7%), unemployed mothers (74.5%) who practiced bottle feeding (44.4%) showed high percentage of acute otitis media documented with Hamdiya A.S.Alfadli et,al, kuwait(2006) which shown that educated and high- income mother were more practice bottle feeding<sup>39</sup>,probably due to their think that bottle feeding is a sort of civilization. However ,they didn't catch up to recent western civilization in relation to a healthy lifestyle including breast feeding<sup>40</sup>.

Judith Ellestad et,al india(1979)<sup>41</sup>,W.H.oddy et,al(2003)<sup>42</sup>,Daly.k.A. et,al(1999)<sup>43</sup>,Duffy L.C.et,al(1995)<sup>44</sup> . Dewey KG.et,al(1995),and Aniasson G et,al(1994) concluded that breast feeding has a protective effect against incidence of otitis media even in affluent highly educated population.<sup>45,46</sup>,they agreement with Ermis Vogaziano et,al(2007)<sup>47</sup>.

**LIMITATION OF STUDY:**

Limiting the study to Al-nasyria Governorate will affect generalization of the study results to all women in Iraq. The study design (cross sectional) will not explain a causal relationship between any of the factors involved in the study. Thus further research is needed to confirm the findings of this study.

**CONCLUSION**

The results of this study showed that the mothers in al-Nasyria region practiced bottle-feeding due to their lack of experience and lack of awareness on the breast milk production mechanism. At the same time, pediatrician's prescription of infant formula and mothers misconceptions about breast-feeding was an important reason for bottle-feeding. Therefore, health education programs focusing on promoting breast-feeding are recommended. Such programs should provide accurate information to correct misconception about breast-feeding among young mothers and health care providers. From the point of view of keeping ears healthy and avoiding otitis media and other infections, breast-feeding is best for infants. Just as clearly, if parents cannot breast feed, it is critical to use feeding bottles that are designed to prevent nipple collapse and air bubble formation. Both are indicators that negative pressure has formed in the feeding container. Studies have shown that this pressure can be transferred into the middle ear. Negative pressure within the ear may lead to serious infection or other ear disease, causing hearing impairment and a risk for delayed speech development. It may also put a child at risk for a host of other, potentially serious ear problems.

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