

9 紹 介

(雜誌等)

食品媒介によるトキソカラ症

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トキソカラ症はイヌ回虫 *Toxocara canis* やネコ回虫 *Toxocara cati* などのトキソカラ属線虫の幼虫が、非固有宿主であるヒトの体内に侵入して、種々の症状を引き起こす幼虫移行症を総称する。イヌ回虫症およびネコ回虫症は重要な人獣共通寄生虫症でもある。ヒトへの感染経路は、ウシ、ニワトリなどの生肝や生肉内に寄生する第3期幼虫の喫食、または生野菜などに付着した虫卵の経口摂取によるものであり、トキソカラ症は食品媒介感染症としての重要性を再認識すべき寄生虫症である。

本稿では、まず、イヌ回虫とネコ回虫の生物学、トキソカラ症のヒトへの感染様式について解説した。次に、トキソカラ症の4つの病型（内臓型、神経型、眼型および潜在型）について、症例報告された主な論文を引用して、表を作成し呈示した。さらに、診断、治療、感染予防についても言及した。

本症について検索すると、実に多数の症例が報告されているが、誌面が限られており限定した文献にとどめた。肝障害、呼吸器症状、脊髄炎、眼症状などにおける原因不明の疾患では、本症も鑑別疾患に加えることが望まれる。

日本食品微生物学会誌：31(1), 1-12 (2014)

寄生虫卵、幼虫および消化管寄生原虫の検査法

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国内には多種多様な寄生虫類が存在しているが、著しいグローバル化に伴い輸入寄生虫症の存在も危惧される。そこで、検査材料から虫卵、幼虫および原虫類の存在を証明するための各検査方法に関して、図1~5ではイラストにより詳細に解説した。また、普通寒天平板培地法、原虫類を検出するための培養法および各糸状虫におけるマイクロフィラリアの特徴と差異についても呈示した。

臨床と微生物：40(4), 275-284 (2013)

コクシジウム類、ブラストシスチス、バランチジウム、クドア

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エイズに合併すると難治性で、重篤化するコクシジウム類などの原虫類について解説した。また、近年、食中毒を起こすことが特定されたクドアおよびサルコシスティスに

ついて解説した。本稿では、原虫類の写真を20枚呈示した。

臨床と微生物：40(4), 297-306 (2013)

Molecular phylogenetic analysis of *Orientia tsutsugamushi* based on the groES and groEL genes

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DNA sequences encoding the GroES and GroEL proteins of *Orientia tsutsugamushi* were amplified by the PCR and sequenced. Pairwise alignment of full-length groES and groEL gene sequences indicated high sequence similarity (90.4-100% and 90.3-100%) in *O. tsutsugamushi*, suggesting that these genes are good candidates for the molecular diagnosis and phylogenetic analysis of scrub typhus. Comparisons of the 56-kD type-specific antigen (TSA) protein gene and the groES and groEL genes showed that genotypes based on the 56-kD TSA gene were not related to a cluster containing the groES and groEL genes in a dendrogram, suggesting that a gene rearrangement may be associated with homologous recombination in mites.

Vector Borne Zoonotic Dis.: 13(11), 825-829 (2013)

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Epidemiological Studies on Intestinal Protozoa in Pigs in Saitama, Japan

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We surveyed the rates of internal infection of swine with gastrointestinal tract protozoa by checking the stools of 334 pigs (suckling pigs, growing pigs aged 1 to 6 months and sows or sow candidates) on 8 hog farms in Saitama, Japan from September to November 2009. Oocysts and cysts per gram of stools in all pigs were calculated. Parasite detection rates were statistically analyzed for each of the farms, age groups, and stool condition scores, and the relationship between parasitic infection and diarrhea was investigated. *Cryptosporidium* was detected in 79 pigs (23.7%) of all pigs checked, *Giardia* was found in 53 (15.9%), *Balantidium* in 155 (46.4%), and coccidium in 20 (6.0%). The rate of *Cryptosporidium* infection was higher in the 2- and 3-month-old groups (55.6 to 60.0%) than in the others (2.5 to 27.6%) ($P < 0.05$): oocysts per gram of stools of 104 to 105 were detected in a total of 33 suckling pigs and 2- and 3-month-old pigs, including 10 of an outdoor farm. There was a correlation between the infection rate and diarrhea in five piglets aged 1 month or younger. In addition, the number of 6-month-old pigs infected with *Giardia* was 40.0%, as opposed to just 5.1% ($P < 0.05$) of suckling pigs. Detection rates differed among farms. The *Balantidium* infection rate was high in pigs older than 4 months (45.0 to 78.9%), as opposed to 15.4 to 17.2% ($P < 0.05$) in pigs younger than 1 month.

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Age-related detection and molecular characterization of *Cryptosporidium suis* and *Cryptosporidium scrofarum* in pre- and post-weaned piglets and adult pigs in Japan.

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We investigated the distribution of *Cryptosporidium* in pigs in Japan by immunofluorescence staining of fecal samples and characterization of isolates by multilocus sequencing. The 344 animals sampled on eight farms included pre-weaned piglets (<1 month old; $n = 55$), weaned piglets (1-2 months old; $n = 65$), finished pigs (2-4 months old, $n = 105$) and of 4-6 months old ($n = 67$), sows ($n = 36$), and boars ($n = 16$). Average prevalence of *Cryptosporidium* on farms was 32.6%, ranging from 4.9 to 58.1%, decreasing with animal age (prevalences of <1 month old, 1-2 months old, 2-4 months old, 4-6 months old, sows, and boars were 27.3, 47.7, 41.9, 22.4, 11.1, 18.8%, respectively). Piglets (<1 and 1-2 months old) showing signs of diarrhea shed relatively more oocysts (5.28 in average log scale of oocysts per gram) in feces than piglets with normal or loose stools (those of 4.90). Thirty seven successful sequencing of the 18S ribosomal RNA gene among 62 examined samples revealed that all of the identified isolates were *Cryptosporidium suis* or *Cryptosporidium scrofarum*, which are generally specific to pigs, and that other species, such as zoonotic *Cryptosporidium parvum*, were absent. Interestingly, *C. suis* was frequently found in piglets younger than 2 months old, while *C. scrofarum* infection was more prevalent in older pigs which also showed increased prevalence of mixed *C. suis* and *C. scrofarum* infections. Sequencing of actin gene loci revealed the existence of variants of both *Cryptosporidium* species in pigs in Japan. Although the number of pigs examined in this study was relatively low, our results suggest that *Cryptosporidium* infection is widespread among pigs in Japan. In addition, the possibility of age-related specificity and pathogenicity in pig infections is also suggested.

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日帰り温泉施設におけるレジオネラ症集団発生事例 —埼玉県

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岡田 浩*1 本多浅夫*1 埼玉県生活衛生課

2012年11月30日から12月17日にかけて、埼玉県外の2名を含む8名のレジオネラ症発生届けがあり、全員が埼玉県内の日帰り温泉施設を利用していた。埼玉県では、患者及び施設の調査結果を踏まえ、当該施設がレジオネラ症集団感染の原因施設であると判断し、公衆浴場法に基づく営業停止命令を行った。

なお、患者数は、行政処分後にレジオネラ症発生届けがあった県外の1例(11月16日に施設利用)を加えると合計9名となり、患者の年齢は50~80代で男性6名、女性3名であった。

当該施設は、平成16年開業の1日平均約800人が利用する日帰り天然温泉施設で、2浴室(甲、乙)を1週間単位で男女交互に使用し、浴室ごとに屋内6、露天6の合計24浴槽を有していた。使用水は、温泉水(ナトリウム-塩化物泉 pH8.1)と井水で、温泉の消毒には銀イオン剤を用いていた。ジェット・ジャグジー等の気泡発生装置はなかったが、ミストサウナ(甲浴室のみ)と各露天浴槽の上部に霧吹き出しがあった。

調査により、当該施設の管理上の問題点が複数認められた。

本事例では、EWGLI (European Working Group for Legionella Infections, <http://www.ewgli.org>) の提唱する遺伝子型別 (Sequence Based-Typing : SBT) 法を併せて行った。その結果、PFGE パターンが一致した3株については、7つの遺伝子領域の塩基配列の組み合わせが、いずれも(7, 6, 17, 15, 13, 9, 11)と決定された。この組み合わせはこれまで登録されていなかったため、SBT のデータベースに新たに申請し、ST1452として新規登録された。

病原微生物検出情報: 34(6), 157-158 (2013)

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埼玉県南部地域における電子ポケット線量計を用いた個人外部被ばく線量の測定

—東電福島第一原子力発電所事故後と事故前の比較—

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埼玉県南部地域(さいたま市及び上尾市)に住居及び職場のある成人8名の個人外部被ばく線量について電子ポ

ケット線量計を用いて調べた結果、1.43~1.88 μ Sv/日であり、個人によって約30%違いがみられた。この原因としては、居住地や生活様式、職場や住居の建築構造等の違いが考えられる。8名の線量を年間線量に換算すると0.52~0.69mSv/年であった。この値は1cm線量当量であり、実効線量に対して安全側の値となること等から単純には比較できないが、日本人の自然放射線による年間外部被ばく線量(実効線量で0.63mSv/年)に比べると同程度かやや低い値であった。

また、個人外部被ばく線量における福島原発事故の影響を調べるため、事故以前(2003年度)に同様な調査を実施した3名について事故以前の値と比較すると、最大0.19 μ Sv/日(0.069mSv/年)増加したが、公衆の被ばく線量限度(実効線量で1mSv/年)の約7%であった。

今回の調査の結果、データ数が少ないことや測定期間が1~2週間ということから限定的ではあるが、埼玉県南部地域の個人外部被ばく線量において福島原発事故の影響はみられたが、特に問題はないことが推測された。しかし、文科省が実施した航空機モニタリングの結果、埼玉県東部及び西部地域の一部において空間放射線量率がやや高い地域があること等から、今後測定地域を増やすなどしてさらに詳しく調べる必要がある。

RADIOISOTOPES: 62(12), 895-900 (2013)

Dioxin profile of human breast milk and dioxin intake by breastfed infants

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Key Facts

- ・Dioxins are persistent environmental pollutants.
- ・Dioxins extensively exist in the environment and are accumulated mainly in the fatty tissue of the human body through bioaccumulation via the food chain.
- ・Dioxins are accumulated in the lipid of human breast milk.
- ・Human breast milk is an excellent nutrient source for infants and plays an important role immunologically, but breastfed infants consume dioxins through their mother's milk.
- ・The influences on the growth of the fetus and infant by exposure to background levels of dioxin have been reported.

Summary points

- ・The concentrations of polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and dioxin-like polychlorinated biphenyls

(dl-PCBs) in human breast milk from two mothers who had different dietary habits and different numbers of previous births were examined periodically over one year.

・The concentrations of PCDD/Fs and dl-PCBs in human breast milk from the primiparous mother significantly decreased during lactation.

・Only dl-PCB concentrations in the human breast milk from the multiparous mother significantly decreased during lactation.

・Total dioxin burden in the milk of the multiparous mother was approximately half that of the primiparous mother.

・Total toxic equivalent in the milk of the multiparous mother was approximately one-third of that of the primiparous mother.

・The congener profiles of PCDD/Fs and dl-PCBs were eliminated from the body through human breast milk showed similar ratios in both mothers.

・The ratio variance of congener profiles of PCDD/Fs and dl-PCBs in human breast milk remained similar during lactation.

・Because the baby takes high levels of dioxin that exceed the tolerable daily intake from the mother's milk, the effect on the health of the baby is a concern, though the exposure is temporary.

Sherma Zibadi^{*3}, Ronald Ross Watson^{*4} and Victor R. Preedy^{*5} (eds.) *Handbook of dietary and nutritional aspects of human breast milk*. pp. 759-775 (2013). Wageningen Academic Publishers, The Netherlands.

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埼玉県における食品の放射能検査

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新規規格基準値施行（平成24年4月1日）から10月末までに埼玉県衛生研究所がゲルマニウム半導体検出器を使用した食品の放射能行政検査について、その結果の概要について報告した。

一般食品は、U-8容器を用い1時間、乳児用食品は、U-8

容器で3時間測定した。また、牛乳及び浸出茶は、2Lマリネリ容器で1時間測定した。

170検体の食品について検査を行ったが、基準値を超えたものは無かったものの、抹茶や原木しいたけ等、比較的濃度の高い食品（放射性セシウムとして約80Bq/kg：基準値100Bq/kg）が見られた。基準値に近い食品もあったことから、今後の検査はより計画的に行う必要があると思われた。

また、規格基準値と同時に通知されたGe半導体検出器による分析法に関して、分析要件（バックグラウンド及びブランク）の解釈と埼玉県独自の実践例について紹介した。

食品衛生学雑誌：54(2)，165-171(2013)

Rapid Analysis of 2-Alkylcyclobutanones in Irradiated Meats, Cheese and Salmon by Direct Solvent Extraction followed by GPC

Kunihiko Takahashi, Rie Ishii, Ryoji Matsumoto

2-Alkylcyclobutanones (2-ACBs) are recognized as a marker of irradiation in lipid-containing food products. Here, a rapid method for the analysis of 2-dodecylcyclobutanone (2-DCB) and 2-tetradecylcyclobutanone (2-TCB) in irradiated food products using direct solvent extraction (DSE) was developed, and the extraction efficiency was compared to that of the Soxhlet extraction method (EN 1785), which is the official method for this analysis. Briefly, 2-ACBs were extracted using a Soxhlet apparatus or DSE with n-hexane. The lipid extract was purified by GPC followed by silica gel cartridge column. Finally, 2-DCB and 2-TCB were measured using GC-MS/MS. The extraction efficiency of 2-ACBs by the DSE method showed almost equivalent as the Soxhlet extraction method. The trueness of 2-DCB and 2-TCB spiked at 50 ng/g in the lipid extractions of beef, pork, chicken, cheese and salmon with the proposed method were 76.6% to 91.6% and 81.1% to 109.0%, respectively. The limits of detection for 2-DCB and 2-TCB in lipid extracts were 15 and 20 ng/g, respectively.

Food Hygiene Safety Science : 54(3), 173-177(2013)

Determination of bisphenol A and 4-nonylphenol in media samples for in vitro fertilization by high-performance liquid chromatography with tandem mass spectrometry

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In vitro fertilization (IVF) is an important treatment for infertility, and in recent years, the delivery rate in IVF has increased markedly with the progress of reproductive medicine. However, chemical contaminants in IVF media have not been fully studied. A simple method using high-performance liquid chromatography coupled with tandem mass spectrometry was therefore investigated for quantitation of bisphenol A (BPA), 4-nonylphenol (NP) and 4-n-nonylphenol (n-NP) in IVF media. Media samples were processed using the solid-phase extraction method. The quantitation limits of BPA, NP, and n-NP were 0.5, 5 and 0.5 ng ml⁻¹, respectively, and the recoveries for BPA, NP and n-NP added to the media samples were above 90%. Commercially available media samples for IVF including 15 media for incubation of ova, 9 sperm washing media (SWM), 4 human serum albumin (HSA) samples and 2 substitute serum (SS) samples were examined, with 2 lots for each sample. NP was detected in 3 media for incubation of ova, 12 SWM, 7 HSA samples and 4 SS samples, in ranges of 6.3-14.5, 5.3-21.7, 5.5-164.0 and 9.0-19.0 ng ml⁻¹, respectively. BPA and n-NP were not detected in any of the samples.

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