CMS
KUNNSKAPSHULL/ KUNNSKAPSBEHOV

Innspill til diskusjon

Olav Breck , MH group

SAMLING VERDIKJEDE HAVBRUK
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CMS Consortium , 2008-2011

Objectives

The principal objectives of the project are to identify causal factors leading to the development of CMS, improve diagnostic tools and suggest strategies for prevention and control to reduce the occurrence and consequences of the disease.

Sub-goals are to:

1. Identify risk factors associated with CMS outbreaks by conducting epidemiological studies.

2. Evaluate potential risk factors based on current hypotheses on environmental and nutritional impact.

3. Describe disease mechanisms with particular focus on developing a better and broader understanding of pathogenesis.

4. Develop improved diagnostic tools, to improve differentiation of related cardiac pathologies and allow for early diagnosis.

Project is divided into four main scientific work packages:

WP I: Epidemiology and pathogenesis studies
WP II: Infection experiments and aetiology studies
WP III: Molecular and physiological pathogenesis
WP IV: Development of specific or indicative markers for disease development

Main challenge:
- Ensure proper diagnosis vs. other related diseases (PD, HSMI..)

Project details

- Duration 2008 – 2011
- Total budget 21, 5 mill NOK
- Funding from NRC: 6 mill NOK
- FHF: 3.3 mill NOK
- Direct and in kind funding from MHN, Lerøy Seafood Group ASA, Aqua Gen & Pharmaq. In kind support from EWOS.

Koch's postulates:
to establish link between a causative microbe and a disease

1.The microorganism must be found in abundance in all organisms suffering from the disease, but should not be found in healthy organisms.
2.The microorganism must be isolated from a diseased organism and grown in pure culture.
3.The cultured microorganism should cause disease when introduced into a healthy organism.
4.The microorganism must be reisolated from the inoculated, diseased experimental host and identified as being identical to the original specific causative agent.

What do we know ?

- The causative virus, PMCV, has been identified
  (Pharmaq and NSVS, NVI)

- Epidemiology work show a very complex picture
  (eg PRV widely spread)

- Not all CMS cases with CMS changes only.

- Many control sites with cardiac lesions, incl CMS

  48 randomly selected control farms: 18 with CMS like lesions, of which 12 were diagnosed CMS (Marta Alarcon, pers. comm)

→ Makes identification of risk factors more difficult

What do we know about PMCV ?

- In close to all sites with typical CMS lesions *
- Not present in sites with no lesions*
- Positive correlation CMS histo score and virus load, both from challenge tests and field material**
- PCR test available, enabling

  diagnostics and screening, epidemiology, studies on reservoir & vectors, vaccine development.**

* Wiik-Nielsen, Haugland et al. Frisk Fisk 2011
** Haugland et al. Samling verdikjede havbruk 2011

What do we know about CMS/PMCV ?

- Histpathology + PCR necessary to verify CMS diagnosis*
- Disease is underdiagnosed*
- Viral persistance (1.5 year) *
- Virus present in many organs (highest in heart, kidney, spleen)**
- High responders and low responders (no development of pathology)**
- Potential to include CMS resistance in breeding programs (family variation) through conventional methods or QTL approach ***

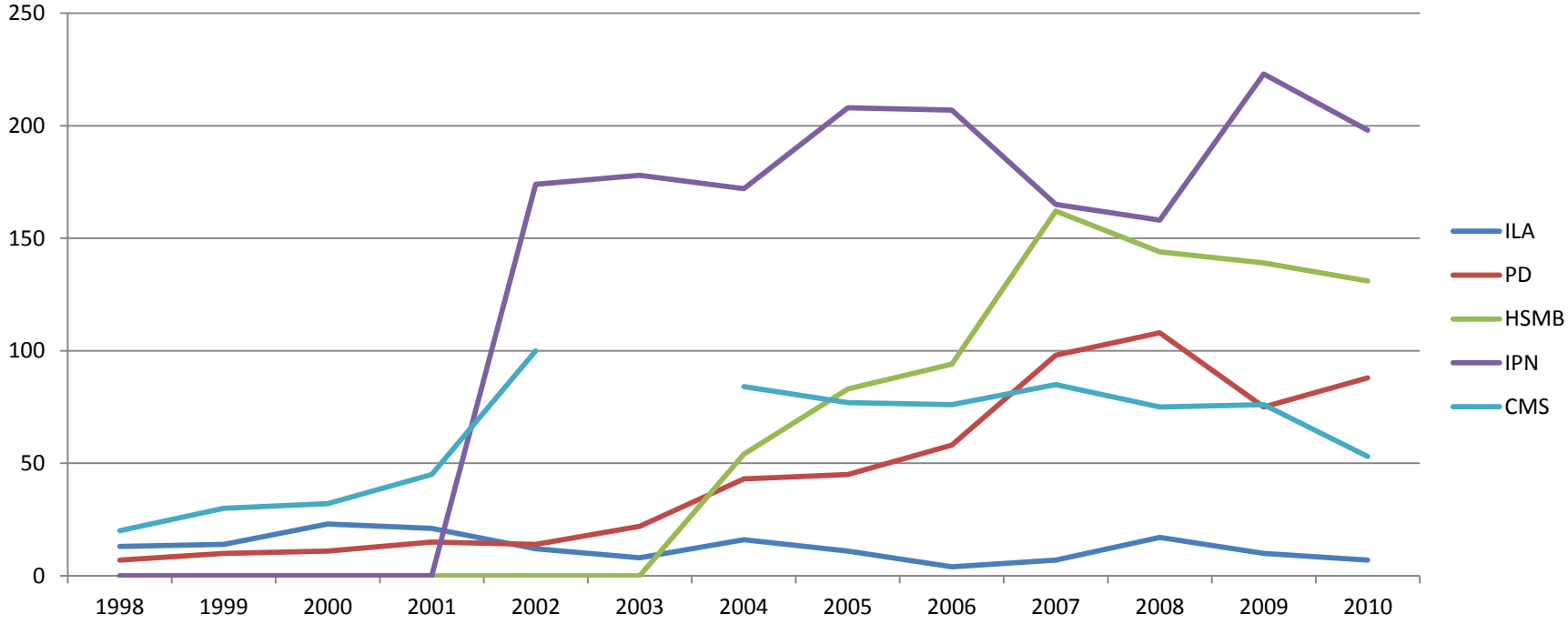
* Marta Alarcòn et al. Samling verdikjede havbruk 2011

** Jørgensen et al. Samling verdikjede havbruk 2011

*** Fineid et al. Samling verdikjede havbruk 2011

control of infectious diseases ?

- IPN - no reduction in yearly incidence
- HSMB - no reduction in yearly incidence
- PD – avoid further spread, mitigate within endemic area (list 3)
- ISA – low yearly incidence (list 2, strategy ref.: EU, OIE)



CMS
2010: 53 sites
1988 : 60 sites
(Poppe, pers comm)

VI, FISKEHELSERAPPORTEN 2010, eldre rapporter

What do we need not know about PMCV / CMS ?

- Transmission routes
- Reservoir & vectors
- Possible risk factors

  nutrition, stress, environment..
- Role of / interaction with other agents
- Why fish die in field, but not in challenge tests ?
- Etiology of CMS like (non PMCV) lesions