

ADVISE: First Results of a European Interoperative Information System Network Developed for the ADenoVirus Initiative Study in Epidemiology

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Abstract. Adenoviral conjunctivitis is extremely contagious, causes a form of conjunctivitis. Therefore, it is important to identify patients who suffer from adenoviral conjunctivitis, as early as possible, in order to contain the disease. We present the 6 independent but interoperable platforms developed for the purpose of a large European epidemiologic study (ADVISE), which has been implemented independently in France, Germany, Spain, Italy and the UK. ADVISE is a non-interventional, observational epidemiology study with the objectives of assessing clinical characteristics and incidence of adenovirus conjunctivitis. One of the challenges faced in developing this network of European epidemiology platforms has been the multilingual context. Actually, we have established independent platforms fully dedicated to each of the participating countries. Similar protocols have been submitted across these countries, allowing individual and pooled analyses of the data. A standardized questionnaire is used to collect patient ocular medical history.. The electronic questionnaire contains 151 items with automatic coherence control. The first platform ADVISE was set up in France. Development, evaluation and validation of this platform were carried out between January and July 2013. The Medical Informatics and Knowledge Engineering Laboratory (LIMICS), proposes through this project, a tool that allows the installation and application of epidemiologic monitoring in any part of the world..

Keywords. Infectious Disease Reporting, Epidemiologic Studies, Health Information Systems, Adenovirus Infections.

Introduction

Adenoviral conjunctivitis is extremely contagious, causes a form of conjunctivitis, which may be unpredictably severe, and can lead to persistent morbidity. Therefore, it is important to identify patients who suffer from adenoviral conjunctivitis, as early as possible, in order to properly manage the patient's expectations and contain the disease [1,2].

The introduction of communication and information technologies, as tools used to help decision-making in health, allowed in many cases, and should still allow better in

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the future, detecting, locating and circumscribing rapidly unusual situations in term of public health [3]. Inserm (the National Institute of Health and Medical Research in France) in collaboration with the Ministry of health developed an electronic monitoring system for contagious diseases [4]. Within this framework, we present the 6 independent but interoperable platforms developed for the purpose of a large European epidemiologic study (ADVISE), which has been implemented independently in France, Germany, Spain, Italy and the UK. This device is equipped with graphic and cartographic interactive restitutions of the observed data and is accessible on line.

One of the challenges faced in developing this network of European epidemiology platforms has been the multilingual context. Actually, we have established independent platforms fully dedicated to each of the participating countries. Each country site investigators are able to enter their patient's data in local language. However, it is of utmost importance to ensure consistency of the data across these platforms in order to be able to perform both independent and pooled analyses of the data collected in all participating countries.

1. Methods

A standardized questionnaire is used to collect patient ocular medical history. The electronic questionnaire contains 151 items with automatic coherence control. For patients attending follow up visits, additional data could be collected.

ADVISE is a community platform which allows to lot of users to collaborate within the same unit: the surveillance network. This on line system allows creating very rapidly a monitoring network without any particular informatics skills. All operations are supported by a web-based interface. It proposes a strong and highly configurable application in order to suit any type of monitoring needs. This is very simple to deploy since it is entirely automated, and guides the user step by step. From the creation of a network to data visualization under various representations, the Web interface assists the user to data processing at all steps.

Once the network is created, it is possible for the administrator to create as many monitoring modules as he wishes. It is particularly easy to create forms: the number of supervised criteria is infinite and numerous types of data are available (Text, all types of number, drop-down list, check box, date).

Once the system is installed and configured and the investigators are registered to take part to the monitoring project, medical data can be collected via a protected Web interface and stored in the database. The platform offers several tools enabling access to a synthetic representation of the information stored in the database, as well as analysis tools.

2. Results

The first platform ADVISE was set up in France. Development, evaluation and validation of this platform were carried out between January and July 2013. From July onwards the platform "France" is in production i.e. open to the investigators for data entry.

Table 1. Comparing the activity of different platforms depending on the participating countries.

Country	Date	Nb. centers	Nb. Invest.	Nb. Cases	Date 1st case	Date last case
France	July 17, 2013	19	36	308	July 25, 2013	November 13, 2014
Germany	March 24, 2014	14	28	182	April 8, 2014	November 11, 2014
Spain	June 10, 2014	14	27	74	July 11, 2014	November 5, 2014
Italy	October 28, 2014	0	0	0		
UK	November 4, 2014	0	0	0		

The review of the patient's signs and symptoms shows that, overall, the patients tested positive for adenoviral conjunctivitis present higher percentages of signs and symptoms suggesting a more severe condition. However, none of these signs or symptoms could be qualified as pathognomonic of the disease.

3. Discussion

The Medical Informatics and Knowledge Engineering Laboratory (LIMICS), proposes through this project, a tool that allows the installation and application of epidemiologic monitoring in any part of the world. It is easy to use and allows dynamic and interactive cartographic representations. This approach not only makes it possible to create, manage and support monitoring (collection of information to the redistribution on a large scale of analyses on this information) but it also has several functions for the installation and animation of the networks participating in the process of monitoring. This tool meets a need for development and improvement of monitoring systems. Computers clearly modified the approach for the monitoring of environment and health. For example, the results of the interim analysis of our European epidemiology study showed that the patients diagnosed with adenoviral conjunctivitis present more signs and symptoms compared to the other patients, although none of them seems to be pathognomonic of the disease. This is consistent with the investigator's clinical assessment not being confirmed in half of the cases. These results also stressed the contagiousness of the disease, highlighting the need of implementing preventive measures to contain the virus spread.

References

- [1] Rietveld RP. Diagnostic impact of signs and symptoms in acute infectious conjunctivitis: systematic literature search. *BMJ* 2003;327:789.
- [2] Dart, J. K. et al. Identification & control of nosocomial adenovirus keratoconjunctivitis in an ophthalmic department. *Br J Ophthalmol* 2009; 93,18-20
- [3] L. Toubiana L, M. Cuggia *Health Information Systems: Toward Evidence-based Health Information Systems?* Yearb Med Inform. 2013;8(1):114-6
- [4] L. Toubiana, S. Moreau, G. Bonnard *MetaSurv: Web-platform generator for the monitoring of health's indicators and interactive geographical information system.* Stud Health Technol Inform. 2005;116:989-93.