The potential for misusing "genetic predisposition" in Canadian courts and tribunals

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The fulfilment of promises made 25 years ago to link clinical conditions with gene sequences has allowed patients and families to better understand hereditary conditions[1–4] and make choices regarding prevention, early detection and treatment.[2–4] There have also been warnings issued over this period regarding other purposes for which genetic information may be used, such as discrimination[5] against people with a genetic predisposition for the purposes of employment or insurance. There has also been concern that the "geneticization" of health might divert focus to individual, rather than social, determinants of health and away from the communal responsibility for health.[6–8]

These factors have not been comprehensively surveyed, particularly in law, in any jurisdiction. We analyzed the way in which genetic predisposition was used in Canadian courts and tribunals, including the clinical conditions for which genetic predisposition was cited, the area of law in which the case occurred, the legal issues that were raised, the results of the proceedings and the purposes for which genetic predisposition was introduced.

We searched the inclusive electronic databases of Canadian legal cases (Quicklaw, Canadian Legal Information Institute, and Société québécoise d'information juridique) and the websites of individual tribunals, using the search term "genetic predisposition." These were exhaustive searches of both English- and French-language cases. Each case was read to determine how genetic predisposition was used in terms of the clinical condition, area of law and legal outcome. We also undertook electronic searches for the term "genetic discrimination." The earliest case we found was decided in July 1984 and we stopped the search in May 2010. The following search terms were used: genetic predisposition, genetic pre-disposition, genetically predisposed, genetically pre-disposed, prédisposition génétique (hereinafter referred to as genetic predisposition) and genetic discrimination.

Clinical conditions

There were 490 genetic predispositions to clinical conditions cited in 468 Canadian legal cases (18 cases included claims of genetic predisposition for two or more conditions). Genetic predisposition most often referred to conditions affecting the musculoskeletal system (188 predispositions), such as osteoarthritis (40 predispositions), degenerative disc disease (32 predispositions), carpal tunnel syndrome (24 predispositions) and Dupuytren contracture (23 predispositions). The second most frequent set of diagnoses for which genetic predisposition was cited referred to conditions affecting mental health (100 predispositions), particularly mood disorders (39 predispositions), schizophrenia (12 predispositions), alcohol dependence (8 predispositions) and substance abuse (7 predispositions). Table 1 lists the clinical conditions for which genetic predispositions were argued in the cases found using our search strategy.

Area of law

Genetic predisposition was frequently cited in labour law (368 predispositions in 355 cases), particularly in relation to conditions affecting the musculoskeletal system (176 predispositions). In workers' compensation appeals tribunals (339 of the 355 cases dealing with labour law), employers (and sometimes tribunal medical experts) cited genetic predisposition when arguing that a disabled worker's condition was not occupational in nature; workers, however, generally either denied the existence of a genetic predisposition or argued that their work was the cause of

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KEY POINTS

- Genetic predisposition has been raised in 468 cases in Canadian courts and tribunals, most frequently in cases concerning workers' compensation.
- Reference to genetic predisposition was associated with an undesirable legal outcome for the person with the supposed predisposition in 134 cases and with the sought-after legal outcome for those people in 86 cases.
- Adjudicators may not appreciate the complexity of the genetic information presented, or they may not ask the nuanced questions required to place genetic information in the correct context.
- Arguing hereditary aspects of health in labour law may diminish the weight Canadian courts and tribunals give to the occupational, environmental and social determinants of health.

their injury.[9–11] In some cases, workers argued that the workplace triggered or aggravated a genetic predisposition.[12] It was not always possible to determine conclusively which participant had raised the issue of genetic predisposition, whether it was raised in response to a question or

Table 1: Clinical conditions cited in 468* Canadian courts and tribunals for which genetic predisposition was raised, and the areas of law in which the cases were argued

		Area of law, no.								
Clinical condition	*n*	Labour	Tort	Family	Criminal	Insurance	Pension/ benefits	Tax	Human rights	Other
Musculoskeletal										
Osteoarthritis	40	39	1							
Degenerative disc disease	32	30	2							
Carpal tunnel syndrome	24	24								
Dupuytren contracture	23	23								
Ankylosing spondylitis	11	11								
Fibromyalgia	10	8				2				
Other	48	41	6			1				
Total	188	176	9			3				
Mental health										
Mood disorder	39	18	5	2	7	2	2	2	1	
Schizophrenia	12	7	1	2		1	1			
Alcohol dependence	8	4	1		2				1	
Substance abuse	7		5	1	1					
Other	34	9	4	8	7	2		3	1	
Total	100	38	16	13	17	5	3	5	3	
Respiratory										
Asthma	15	14		1						
Other	16	16								
Total	31	30		1						
Cancer										
Lung cancer	4	4								
Other	22	17	2				2			1
Total	26	21	2				2			1
Neurologic										
Migraine	11	6	5							
Other	12	3	6			2				1
Total	23	9	11			2				1
Allergy	23	20	1	1						1
Circulatory system	23	16	4			1	2			
Dermatologic	21	19					2			
Hearing loss	13	13								
Digestive system	6	3		1				1		1
Endocrine	7	6				1				
Other	29	17	4	4	2			1		1
Total	490	368	47	20	19	12	9	7	3	5

*Eighteen cases contained references to two or more distinct genetic predispositions.

argument by the other party or the adjudicator, or how genetic predisposition influenced the results of the proceedings.

In insurance law, genetic predisposition was a consideration in determining whether clinical conditions, such as rheumatoid arthritis[13] or seizure disorders,[14] were related to a person's injury. Similarly in tort law, where a plaintiff could only receive compensation if the condition was found to have been caused by the negligent act of the defendant, the issue of genetic predisposition was considered in relation to the cause and extent of damages suffered.[15,16]

In criminal law, genetic predisposition was most often used to argue the importance of an accused person's mental condition in relation to criminal responsibility,[17,18] and it was also considered when determining sentencing.[19,20]

In family law, genetic predisposition was taken into consideration when granting custody of a child and determining wardship. In this context, it could be argued that granting custody to a biological parent with whom a child shares a genetic predisposition could be more favourable than granting custody to adoptive parents.[21,22]

Outcomes of legal proceedings

Genetic predisposition was cited in cases heard in each of the provinces and the Yukon, including 175 cases in Ontario, 134 in British Columbia, 79 in Quebec and 31 in Alberta. A search of all cases for the term "genetic discrimination," indicated that it was not raised. In 134 cases, reference to genetic predisposition was associated with an undesirable legal outcome for the person with the supposed predisposition. In 86 cases, the introduction of genetic predisposition did not harm the case of the person with the supposed genetic predisposition. In the remaining 248 cases, the legal significance of introducing the concept of genetic predisposition was not clear.

Challenges of using genetic information in court

Although increased communication of genetic information among scientists, clinicians, patients and family members can increase understanding[1–4] and possibly mitigate the effects of genetic conditions, this is not the reason for presenting genetic information in courts and tribunals. Rather, genetic information is usually presented to substantiate the claim that an employee's health problem is related to a genetic predisposition instead of an occupational injury. These cases are often workers' compensation appeals tribunals, where the burden of proof of an occupational cause for a condition rests with the employee.

Unfortunately, adjudicators may lack the necessary scientific or clinical background to appreciate the complexity of the genetic information presented to them or to ask the nuanced questions required to place the information in the correct context. This is of particular concern given that most of the cases in which genetic predisposition was cited involved conditions affecting the musculoskeletal system and mental health — conditions for which there are nongenetic causes, such as repetitive motion[23,24] or socioeconomic factors.[25,26] Genetic predisposition appears even less likely as the cause of fungal infections of the toenail[27] or uterine prolapse.[28]

Genetic reductionism

When genetic predisposition is argued in courts or tribunals as the cause of a clinical condition, more relevant occupational or social contributors may be relegated to the background. This form of genetic reductionism may be similar to disability reductionism ("letting a part stand for the whole")[29] in narrowly focusing on genetic predisposition rather than multiple physiologic and social factors. The geneticization of health contributes to a focus on individual responsibility for disease over social responsibility[6–8] and may diminish the development of programs that promote health and prevent harm.

The concerns that scholars have raised over the past 25 years regarding the impact of new genetic tests on genetic reductionism[6–8] were not confirmed in our analysis, as only eight cases mentioned that genetic testing occurred.[30,31] The increased awareness of genetic contributors to disease generated by media reports on the Human Genome Project, and more recent reports on personalized treatment strategies, is a more likely contributor to the focus on family histories of inheritable conditions in Canadian courts and tribunals.

Closing thoughts

Genetic predisposition to clinical conditions was cited in 468 Canadian legal cases. The prominence of arguing hereditary aspects of health in labour law, most frequently as they relate to musculoskeletal and mental health, may diminish the weight Canadian courts and tribunals give to occupational, environmental and social determinants of health. Adjudicators cannot be expected to have the scientific and clinical knowledge

needed to appreciate the nuances of arguments related to genetic predisposition. Although it is encouraging that we found no cases of genetic discrimination in Canadian courts and tribunals, future monitoring is required.

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